

TEXAS CITY CHANNEL, TEXAS
(Industrial Canal)

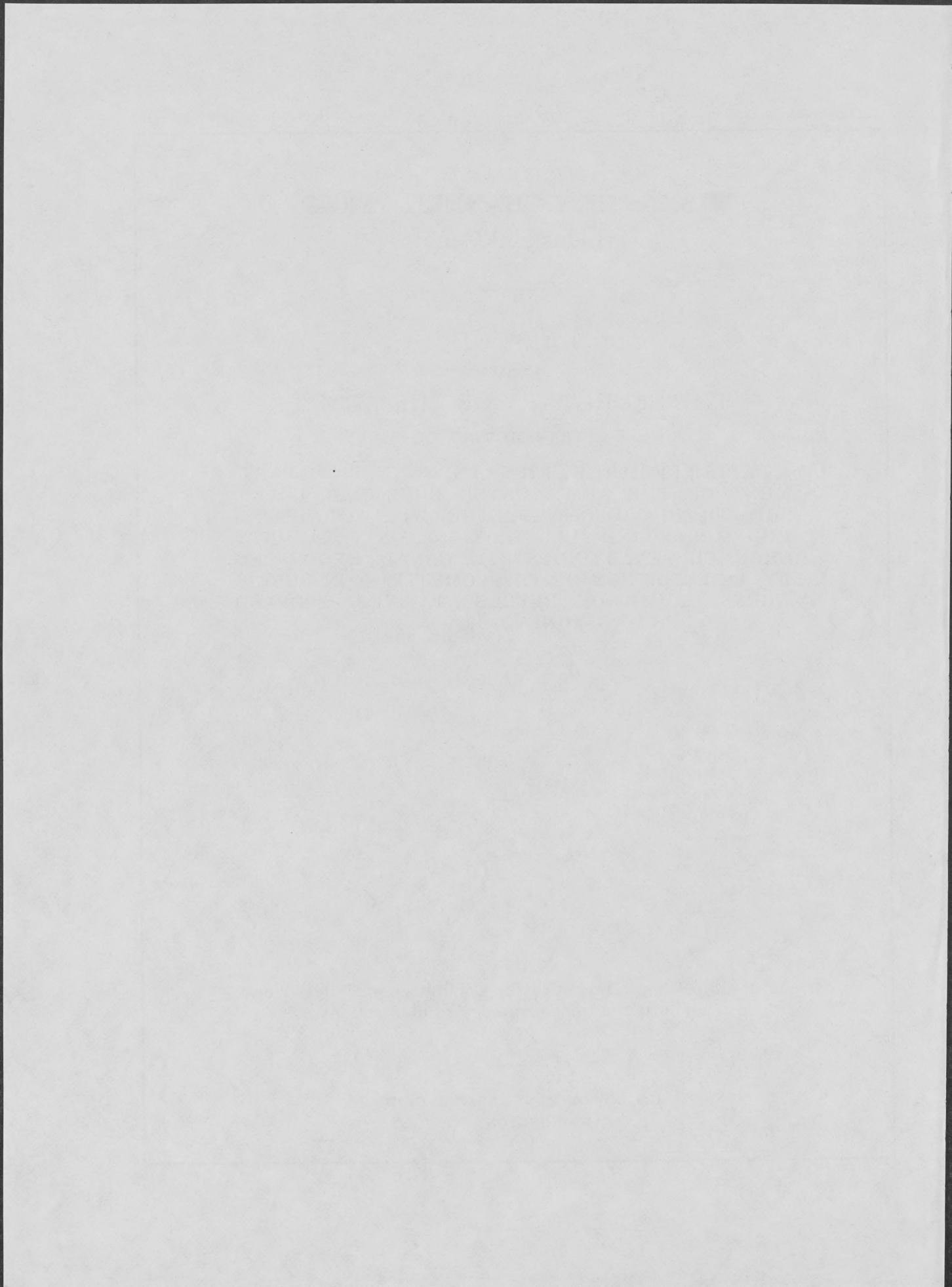
LETTER
FROM
THE SECRETARY OF THE ARMY
TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY, DATED NOVEMBER 4, 1970, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON TEXAS CITY CHANNEL, TEXAS (INDUSTRIAL CANAL), REQUESTED BY A RESOLUTION OF THE COMMITTEE ON PUBLIC WORKS, HOUSE OF REPRESENTATIVES, ADOPTED JUNE 23, 1964



APRIL 13, 1972.—Referred to the Committee on Public Works
and ordered to be printed with illustrations

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1972



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Plate No. 2. Plan of improvement.
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LETTER OF TRANSMITTAL



DEPARTMENT OF THE ARMY WASHINGTON, D.C. 20310

April 5, 1972

Honorable Carl Albert
Speaker of the House of Representatives
Washington, D. C. 20515

Dear Mr. Speaker:

I am transmitting herewith a favorable report dated 4 November 1970, from the Chief of Engineers, Department of the Army, together with accompanying papers and illustrations, on Texas City Channel, Texas (Industrial Canal), requested by a resolution of the Committee on Public Works, House of Representatives, adopted 23 June 1964.

The views of the Governor of Texas and the Departments of the Interior, Transportation, and Health, Education, and Welfare are set forth in the inclosed communications. The environmental statement required by the National Environmental Policy Act has been submitted to the Council on Environmental Quality.

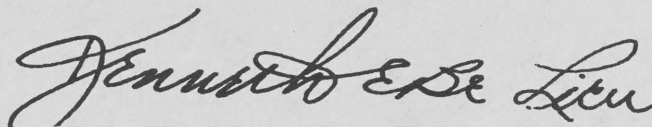
Since this project meets all the requirements of Section 201 of the Flood Control Act of 1965 and involves little or no controversy, I recommend that the project be approved for appropriations.

Subsequent to preparation of the report of the Chief of Engineers, a new interest rate has been adopted for discounting future benefits and computing costs. Using the prescribed rate of 5-3/8 percent, the benefit-cost ratio would be reduced from 2.1 to 1.8.

In accordance with the comments of the Office of Management and Budget, the Chief of Engineers will restudy enlargement of the existing main turning basin during the advanced planning phase based upon the current and immediately prospective fleet use at that time. Enlargement of the main turning basin will not be initiated until the restudy showing justification is approved by the Office of Management and Budget.

Subject to the foregoing, the Office of Management and Budget advises that there is no objection to the submission of the proposed report to the Congress; however, it states that no commitment can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation. A copy of the letter from the Office of Management and Budget is inclosed as part of the report.

Sincerely,

A handwritten signature in cursive script, reading "Kenneth E. Belieu".

KENNETH E. BELIEU
Acting Secretary of the Army

1 Incl
As stated

COMMENTS OF THE OFFICE OF MANAGEMENT AND BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

March 16, 1972

Honorable Kenneth E. BeLieu
Under Secretary of the Army
Washington, D. C.

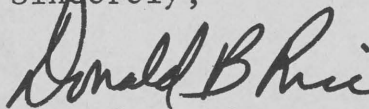
Dear Mr. BeLieu:

Mr. Robert E. Jordan's letter of November 24, 1970, submitted the favorable report of the Chief of Engineers together with accompanying papers and illustrations, on Texas City Channel, Texas (Industrial Canal), requested by a resolution of the Committee on Public Works, House of Representatives, adopted June 23, 1964.

Our review of the report indicates that the proposed enlargement of the existing main turning basin is not properly justified by the methodology used in the report. The report assumes that the average annual benefits will be equal to the average annual costs for a portion of the project proposed to reduce navigation hazards. A proper justification would be based upon the current and immediately prospective fleet which uses and will use the turning basin. Accordingly, the turning basin should not be enlarged until such time as a restudy of that portion of the project showing such a justification is approved by the Office of Management and Budget.

Subject to the above, you are advised that there would be no objection to the submission of the proposed report to the Congress. No commitment, however, can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely,



Donald B. Rice
Assistant Director

COMMENTS OF THE GOVERNOR OF TEXAS



PRESTON SMITH

GOVERNOR OF TEXAS

September 18, 1970

Lieutenant General F. J. Clarke
Chief of Engineers
Department of the Army
Building T-7, Gravelly Point
Washington, D. C. 20310

Dear General Clarke:

Having reviewed the Corps of Army Engineers' report "Texas City Channel, Texas" and given consideration to the findings of the Texas Water Rights Commission, I wish to express my approval.

The project is feasible and in the public interest.

I concur in your comments that the five points posed under the National Environmental Policy Act of 1969 credit the proposed project as providing beneficial impact on fish, wildlife and the public welfare and not impairing the environment. However, possible deteriorating effect on the ecology in close proximity to the project could occur. Therefore, close cooperation between the Corps of Engineers and the Texas Parks and Wildlife Department is requested.

An early authorization and funding of this project by Congress are respectfully urged.

With kindest regards.

Sincerely,

A handwritten signature in dark ink, reading "Preston Smith". The signature is stylized with a large, flowing "P" and "S".
Preston Smith

COMMENTS OF THE DEPARTMENT OF THE INTERIOR



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

November 4, 1970

Dear General Clarke:

This responds to your letter of July 31, 1970, in which you request our comments on your proposed report and draft environmental statement for Texas City Channel, Texas (Industrial Canal).

We have reviewed the report and draft statement and in general concur with your recommendations. We offer the following comments for your information and use.

We recommend that prior to construction of the project, the bottom sludges and sediment be examined to determine if their discharges and disposal would adversely affect the water quality of the area. If tests indicate that deposition of the sludge would adversely affect water quality, measures should be taken to control and contain the spoil deposits.

The proposed plan of improvement for the Texas City Channel should be coordinated with the Texas Water Quality Board so that the Board can include its impact in planning future water quality studies.

To protect water quality during the construction period in accordance with provisions of Section 21(a) of the Federal Water Pollution Control Act, as amended, and Executive Order 11507, we recommend that contract specifications require all contractors and subcontractors to:

1. Exercise care in relocation of any petroleum product pipelines and take precautions in the handling and storage of hazardous materials such as petroleum, herbicides, and pesticides, to prevent accidental spillages or usage that would result in water pollution.
2. Provide and operate sanitary facilities to adequately treat and dispose of domestic wastes in conformance with Federal and State water pollution control regulations.

3. Perform all construction operations so that they will keep erosion, turbidity and siltation at the lowest level practicable.

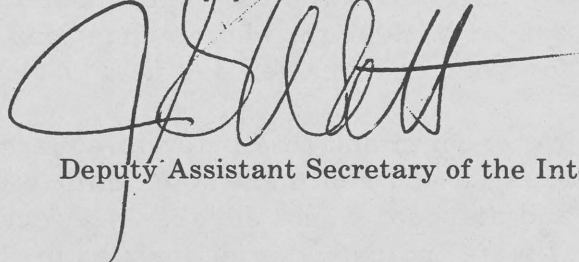
Surveillance of water quality should be maintained during construction and, if there is evidence of residual pollution resulting from the construction operations, these operations should be stopped and measures taken to prevent this pollution before construction is resumed.

The proposed plan would have no significant effects on recreation or fish and wildlife resources.

We find that the environmental statement adequately describes the effect of the project upon the environment.

We appreciate the opportunity of presenting our views.

Sincerely yours,

A handwritten signature in dark ink, appearing to be "J. B. ...", written over the typed name of the Deputy Assistant Secretary of the Interior.

Deputy Assistant Secretary of the Interior

Lt. Gen. F. J. Clarke
Chief of Engineers
Attn: ENG CW-PD
Department of the Army
Washington, D.C. 20314

COMMENTS OF THE DEPARTMENT OF TRANSPORTATION



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDANT (AWL)
U.S. COAST GUARD
WASHINGTON, D.C.
20591

25 September 1970

Lt. General F. J. Clarke
Chief of Engineers
Department of the Army
Washington, D. C. 20314

Dear General Clarke:

This is in response to your letter of 31 July 1970 addressed to Secretary Volpe requesting comments on your proposed report on Texas City Channel, Texas (Industrial Canal).

The concerned operating administrations of the Department of Transportation have reviewed your proposed report along with the draft environmental statement and other pertinent papers and concur in your recommendations for modification of the existing project for Texas City Channel, Texas (Industrial Canal).

No comment is made concerning the draft environmental statement nor upon the environmental impact resulting from completion of the project.

It is noted that the project will require the relocation by the Coast Guard of six minor navigational lights, one set of ranges (two lights), and the establishment of one minor light and one range light with total cost of approximately \$49,000.00. The annual maintenance cost for these navigational aids will be approximately \$4,300.00.

The opportunity afforded this Department to review and comment on your proposed project is appreciated.

Sincerely,

R. Y. EDWARDS
Rear Admiral, U.S. Coast Guard
Chief, Office of Public and
International Affairs

COMMENTS OF THE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

OFFICE OF THE SECRETARY

WASHINGTON, D.C. 20201

November 9, 1970

Lt. General F. J. Clarke, USA
Chief of Engineers
U.S. Corps of Engineers
Department of the Army
Washington, D.C. 20315

Dear General Clarke:

As requested in your letter of July 31, 1970, the navigation report and the draft environmental statement on Texas City Channel, Texas, have been reviewed by the appropriate agencies of the Department that have an environmental interest.

We note that the proposal provides for the widening of the Texas City turning basin and for enlargement of the existing industrial canal and turning basin. Texas City is located on the southeast coast of Texas near the city of Galveston.

Our review of the draft environmental statement and the present report indicates that the project as proposed will have no adverse effect on environmental matters of concern to the Department of Health, Education, and Welfare. We have no objection to the authorization of this project insofar as the Department's interests and responsibilities are concerned.

Sincerely, yours,


Roger O. Egeberg, M.D.

Assistant Secretary
for Health and Scientific Affairs

TEXAS CITY CHANNEL, TEXAS
(Industrial Canal)

REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY



IN REPLY REFER TO

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

ENG CW-PD

4 November 1970

SUBJECT: Texas City Channel, Texas (Industrial Canal)

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress the report of the Board of Engineers for Rivers and Harbors, accompanied by the reports of the District and Division Engineers, in response to a resolution adopted 23 June 1964 by the Committee on Public Works of the House of Representatives, United States, requesting a review of reports on Texas City Channel, Texas, with a view to determining the advisability of modifying the existing project in any way at this time, particularly by extension of the deep-draft channel along the alignment of the Industrial Barge Canal.

2. The District and Division Engineers recommend modification of the existing project for Texas City Channel to provide for widening a portion of the main turning basin to 1,200 feet, for Federal maintenance and enlargement of the locally dredged Industrial Canal and turning basin to a depth of 40 feet and widths of 250 to 350 feet, and for reimbursement of \$122,000 to local interests for dredging that portion of the existing deep-draft Industrial Canal within the limits of the Federally authorized, but undredged, shallow-draft Industrial Barge Canal and basin; at an estimated total project construction cost of \$1,753,000, of which \$1,675,000 is the Federal cost. Annual charges are estimated at \$137,600 and average annual benefits at \$416,400. The benefit-cost ratio is 3.0. They also recommend that all portions of the shallow-draft Industrial Canal and turning basin authorized as part of the Federal project for Texas City Channel, Texas, by the River and Harbor Act of 14 July 1960, but not incorporated in the recommended plan of improvement, be deauthorized.

3. The Board of Engineers for Rivers and Harbors concurs in general in the findings of the District and Division Engineers. However, the Board believes that berthing area widths of 125 feet are desirable for the size of vessels contemplated for the berths adjacent to the existing main channel and turning basin and the Industrial Canal. It also believes that a minimum channel width of 300 to 400 feet should be provided in the Industrial Canal for the safety and ease of the heavy vessel traffic anticipated. The Board, therefore, recommends modification of the existing project to provide for widening the existing main turning basin to 1,200 feet for a length of 2,700 feet at its present depth of 40 feet, including relocation of the basin 85 feet to the east to permit adequate berthing area width; and to provide a 40-foot deep channel in the Industrial Canal at widths of 400 feet from mile 7.46 to mile 8.03 and 300 feet from mile 8.03 to mile 9.15, with a turning basin at the head of the Industrial Canal 40 feet deep, 1,150 feet long, and 1,000 feet wide, and easing of the bend at the entrance to the Industrial Canal. It further recommends that all portions of the authorized Federal shallow-draft Industrial Barge Canal not incorporated in the plan of improvement recommended above be deauthorized. Based on the above, the total estimated cost of the project recommended by the Board is \$2,476,000, of which \$2,351,000 is Federal cost. Annual charges are estimated at \$196,000, annual benefits are \$428,800, and the benefit-cost ratio is 2.2. The net cost to the United States for the recommended project modification, exclusive of navigation aids, is estimated at \$2,302,000 for construction and \$58,000 annually for maintenance in addition to that now required.

4. The Board finds that reimbursement to local interests for work done within the limits of the authorized Federal project in the Industrial Barge Canal is not warranted because of benefits that have already accrued through construction of the deepwater channel. Also, it urges local interests to establish regulations to insure safe and efficient vessel traffic flow at Texas City.

5. I concur in the views and recommendations of the Board.



F. J. CLARKE
Lieutenant General, USA
Chief of Engineers

ENVIRONMENTAL STATEMENT



DEPARTMENT OF THE ARMY OFFICE OF THE CHIEF OF ENGINEERS WASHINGTON, D.C. 20314

IN REPLY REFER TO

ENG CW-PD

13 November 1970

SUMMARY COORDINATION OF ENVIRONMENTAL STATEMENT ON TEXAS CITY CHANNEL, TEXAS (INDUSTRIAL CANAL)

1. Coordination of Environmental Statement.

<u>AGENCY</u>	<u>Date of Transmittal</u>	<u>Date of Comments</u>
Department of the Interior	31 Jul 70	4 Nov 70
Department of Transportation	31 Jul 70	25 Sep 70
Department of Health, Education and Welfare	31 Jul 70	9 Nov 70
State of Texas	31 Jul 70	18 Sep 70

2. Summary of Agency Comments and Views of the Chief of Engineers:

The correspondence from the interested State and Federal agencies is attached as an inclosure to the environmental statement. The agency comments concerning the environmental aspects of the project and the response of the Chief of Engineers are discussed below.

Department of the Interior.

Comment: The Department finds that the environmental statement adequately describes the effect of the project upon the environment.

Department of Transportation.

Comment: The Department stated that no comment is made concerning the environmental statement nor upon the environmental impact resulting from completion of the project.

Texas City Channel, Texas (Industrial Canal)

State of Texas.

Comment: The Governor concurs in the environmental statement. He requested that the Corps of Engineers work closely with the Texas Parks and Wildlife Department to avoid any possible deteriorating effects on the ecology in close proximity to the project.

Response: The Corps of Engineers will work closely with the state agencies concerned with environmental matters during advanced engineering, design, and construction stages of the project.

Department of Health, Education, and Welfare.

Comment: The Department states that the project as proposed will have no significant adverse effect on environmental matters of concern to the Department.

27 July 1970

ENVIRONMENTAL STATEMENT
FOR
TEXAS CITY CHANNEL, TEXAS

PREPARED IN CONNECTION WITH
A SURVEY REPORT OF THE
GALVESTON DISTRICT, CORPS OF ENGINEERS
GALVESTON, TEXAS

TEXAS CITY CHANNEL, TEXAS

ENVIRONMENTAL STATEMENT

1. Project Description. The proposed plan provides for the improvement of an existing waterway which now serves a major industrial complex in Texas City, Texas. The plan calls for the deepening and widening of the Industrial Canal and two turning basins plus easing the bends at the entrance to the canal and the canal turning basin.

2. Environmental Setting Without the Project. This waterway is an essential element of the economy and social well being of the residents of Texas City. It provides a low cost method of importing and exporting industrial products. The income and employment generated by these industries makes a positive contribution to the social well being of the people in this area and Nation. The forecast for increased traffic and vessel sizes will make navigation on this waterway more difficult. The risk of accidents will increase as traffic increases. This could result in loss of life, property and aquatic resources. There are adequate facilities located along this waterway to satisfy the recreational boating needs of the area. Tidal action has a flushing effect in this harbor but vessel traffic and industries along the waterway discharge waste into these waters. Waste disposal operations are regulated by the Texas Water Quality Board which is now in the process of reviewing their standards to insure that adequate water quality will be maintained. Fisherman use in the Texas City channel confirms the existence of an ample fishery resource. No information is available on the nutrient value of the harbor bottoms or disposal areas. However, the proposed disposal site has been used as a disposal area for the Texas City channel dredging in the past and its continued use would not appear to create any environmental problems. There are no known historical or archeological sites located in the work areas.

3. Impact Statement. The following information is furnished in response to Section 102 (2) (c) of the National Environmental Policy Act of 1969.

a. Identify "the environmental impacts of the proposed action." Low cost transportation will insure the retention of a major industrial complex in the Texas City area and the social well being of Texas City residents will be enhanced by the continued high level of employment and income. The larger channel dimensions recommended in the proposed plan will reduce the probability of marine accidents which endanger life, property and the fishery resources in the Texas City area. Adverse effects will be discussed in the next sub-paragraph.

b. Identify "any adverse environmental effects which cannot be avoided should the proposal be implemented." Coordination with the Bureau of Sport Fisheries and Wildlife and the State of Texas indicate that the proposed plan of improvement would not either adversely effect or enhance the fish and wildlife resources of the area.

c. Identify "alternatives to the proposed action." The proposed project does not appear to create any significant environmental problems. The alternative to preserving the existing environmental setting of the Texas City waterway would be to forego development. This alternative would forego almost \$280,000 annually in net benefits plus the environmental gains cited, in sub-paragraph a, above.

d. Discuss "the relationship between local short term uses of man's environment and the maintenance and enhancement of long term productivity." The navigation proposal has both economic and environmental merit for the present and future generations and no conflict is noted between the local short term uses of man's environment and the maintenance and enhancement of long term productivity. The employment, income, and marine safety stemming from the recommended plan enhances the social well being of mankind; and present and future residents of the area will benefit from this project.

e. Identify "any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented." The only known irreversible and irretrievable commitment of resources identified at this time is the labor resource used in the construction and maintenance of the project. Economic growth induced by this project may generate other commitments of land, labor and material resources but we can only recognize their incidence at this time.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

November 4, 1970

Dear General Clarke:

This responds to your letter of July 31, 1970, in which you request our comments on your proposed report and draft environmental statement for Texas City Channel, Texas (Industrial Canal).

We have reviewed the report and draft statement and in general concur with your recommendations. We offer the following comments for your information and use.

We recommend that prior to construction of the project, the bottom sludges and sediment be examined to determine if their discharges and disposal would adversely affect the water quality of the area. If tests indicate that deposition of the sludge would adversely affect water quality, measures should be taken to control and contain the spoil deposits.

The proposed plan of improvement for the Texas City Channel should be coordinated with the Texas Water Quality Board so that the Board can include its impact in planning future water quality studies.

To protect water quality during the construction period in accordance with provisions of Section 21(a) of the Federal Water Pollution Control Act, as amended, and Executive Order 11507, we recommend that contract specifications require all contractors and subcontractors to:

1. Exercise care in relocation of any petroleum product pipelines and take precautions in the handling and storage of hazardous materials such as petroleum, herbicides, and pesticides, to prevent accidental spillages or usage that would result in water pollution.
2. Provide and operate sanitary facilities to adequately treat and dispose of domestic wastes in conformance with Federal and State water pollution control regulations.

3. Perform all construction operations so that they will keep erosion, turbidity and siltation at the lowest level practicable.

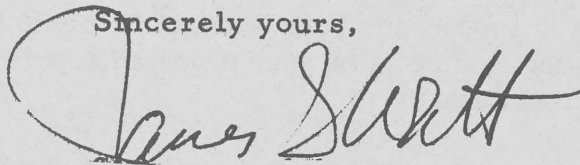
Surveillance of water quality should be maintained during construction and, if there is evidence of residual pollution resulting from the construction operations, these operations should be stopped and measures taken to prevent this pollution before construction is resumed.

The proposed plan would have no significant effects on recreation or fish and wildlife resources.

We find that the environmental statement adequately describes the effect of the project upon the environment.

We appreciate the opportunity of presenting our views.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "James Stewart". The signature is fluid and cursive, with a large initial "J" and a long, sweeping underline.

Deputy Assistant Secretary of the Interior

Lt. Gen. F. J. Clarke
Chief of Engineers
Attn: ENGCW-PD
Department of the Army
Washington, D.C. 20314



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDANT (AWL)
U.S. COAST GUARD
WASHINGTON, D.C.
20591

25 September 1970

Lt. General F. J. Clarke
Chief of Engineers
Department of the Army
Washington, D. C. 20314

Dear General Clarke:

This is in response to your letter of 31 July 1970 addressed to Secretary Volpe requesting comments on your proposed report on Texas City Channel, Texas (Industrial Canal).

The concerned operating administrations of the Department of Transportation have reviewed your proposed report along with the draft environmental statement and other pertinent papers and concur in your recommendations for modification of the existing project for Texas City Channel, Texas (Industrial Canal).

No comment is made concerning the draft environmental statement nor upon the environmental impact resulting from completion of the project.

It is noted that the project will require the relocation by the Coast Guard of six minor navigational lights, one set of ranges (two lights), and the establishment of one minor light and one range light with total cost of approximately \$49,000.00. The annual maintenance cost for these navigational aids will be approximately \$4,300.00.

The opportunity afforded this Department to review and comment on your proposed project is appreciated.

Sincerely,

R. Y. EDWARDS
Rear Admiral, U.S. Coast Guard
Chief, Office of Public and
International Affairs



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

November 9, 1970

Lt. General F. J. Clarke, USA
Chief of Engineers
U.S. Corps of Engineers
Department of the Army
Washington, D.C. 20315

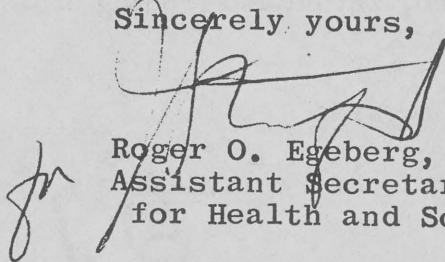
Dear General Clarke:

As requested in your letter of July 31, 1970, the navigation report and the draft environmental statement on Texas City Channel, Texas, have been reviewed by the appropriate agencies of the Department that have an environmental interest.

We note that the proposal provides for the widening of the Texas City turning basin and for enlargement of the existing industrial canal and turning basin. Texas City is located on the southeast coast of Texas near the city of Galveston.

Our review of the draft environmental statement and the present report indicates that the project as proposed will have no adverse effect on environmental matters of concern to the Department of Health, Education, and Welfare. We have no objection to the authorization of this project insofar as the Department's interests and responsibilities are concerned.

Sincerely yours,


Roger O. Egeberg, M.D.
Assistant Secretary
for Health and Scientific Affairs



PRESTON SMITH

GOVERNOR OF TEXAS

September 18, 1970

Lieutenant General F. J. Clarke
Chief of Engineers
Department of the Army
Building T-7, Gravelly Point
Washington, D. C. 20310

Dear General Clarke:

Having reviewed the Corps of Army Engineers' report "Texas City Channel, Texas" and given consideration to the findings of the Texas Water Rights Commission, I wish to express my approval.

The project is feasible and in the public interest.

I concur in your comments that the five points posed under the National Environmental Policy Act of 1969 credit the proposed project as providing beneficial impact on fish, wildlife and the public welfare and not impairing the environment. However, possible deteriorating effect on the ecology in close proximity to the project could occur. Therefore, close cooperation between the Corps of Engineers and the Texas Parks and Wildlife Department is requested.

An early authorization and funding of this project by Congress are respectfully urged.

With kindest regards.

Sincerely,

A handwritten signature in dark ink, appearing to read "Preston Smith", written over a printed name.
Preston Smith

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS



DEPARTMENT OF THE ARMY CORPS OF ENGINEERS BOARD OF ENGINEERS FOR RIVERS AND HARBORS WASHINGTON, D.C. 20315

IN REPLY REFER TO

ENGBR

19 June 1970

SUBJECT: Texas City Channel, Texas (Industrial Canal)

Chief of Engineers
Department of the Army
Washington, D. C.

1. Authority.--This report is in response to the following resolution adopted 23 June 1964:

Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on Texas City Channel, Texas, submitted in House Document Numbered 427, Eighty-sixth Congress, Second Session, and prior reports, with a view to determining the advisability of modifying the existing project in any way at this time, particularly extension of the deep-draft channel along the alinement of the Industrial Barge Canal.

2. Description.--Texas City Channel, located in southeast Texas, is an improved deepwater navigation channel extending northwestward from Bolivar Roads anchorage, near Galveston, across the lower end of Galveston Bay to a main turning basin at Texas City, a distance of about 6.7 miles. The channel connects with the Gulf of Mexico through Bolivar Roads and Galveston Harbor Channel. A locally constructed channel extends from the main turning basin inshore about 1.7 miles to two inner basins, one for use by deep-draft vessels and the second for use by barges. Initially, this channel and the upper basin were constructed as a shallow-draft project referred to as the Industrial Barge Canal. Later, the channel was enlarged to deep-draft dimensions, and a deep-draft turning basin was constructed adjacent to, and downstream from, the barge basin. This waterway extension is now referred to as the Industrial Canal. The mean range of tide along Texas City Channel is 1.3 feet.

3. Existing improvements.--The existing Federal project provides for a channel 40 feet deep and 400 feet wide extending 6.7 miles from Galveston Harbor Channel to a turning basin 40 feet deep, 1,000 feet wide, and 4,250 feet long at Texas City. The channel is protected on the north side by a pile and clay dike, reinforced with a parallel rubblemound dike, extending from the shore a distance of 5.2 miles. The project authorization also provides for Federal maintenance and enlargement of the locally constructed Industrial Canal to a depth of 16 feet and a width of 125 feet for a distance of 1.6 miles, thence a depth of 12 feet over widths of 125 to 195 feet for a distance of 0.3 mile, with a turning basin at the upper end of the canal having a depth of 12 feet, a width of 400 feet, and a length of 415 feet. The project has been completed except for the authorized Federal work on the Industrial Canal. The need for this work was obviated in 1964 when Union Carbide Corporation enlarged the Industrial Canal to a depth of 34 feet and width of 200 feet, dredged a new turning basin 34 feet deep, 1,000 feet wide, and 1,150 feet long, established aids to navigation structures, and constructed terminal facilities for deep-draft commerce.

4. Tributary area and commerce.--Texas City, one of the three principal Galveston Bay ports, has a general tributary area comprising the greater part of Texas and parts of adjacent states. Texas City is principally an oil refining and chemical manufacturing center. Demand for petroleum products and chemicals has brought a large expansion of these industries to Texas City. Three major refineries and four chemical plants are served by an inland system of trunk pipelines, five major railroad lines, and a network of modern highways.

5. The waterway commerce is predominantly petroleum, petroleum products, and chemicals. The total commerce in 1968 was 16.7 million tons, of which 5.7 million tons moved in seagoing vessels and 11.0 million tons moved in barges. The 1968 commerce moving on the Industrial Canal amounted to 3.6 million tons, of which 0.9 million tons moved in seagoing vessels and 2.7 million tons moved in barges. Commerce in chemicals and related products has increased steadily in recent years and in 1968 accounted for about 28 percent of the total commerce.

6. Improvements desired.--Navigation improvements desired by local interests include:

Widening the 34-foot by 200-foot channel in the Industrial Canal to 300 feet, deepening the channel and its turning basin to 40 feet, and Federal maintenance of the improved canal;

Widening the 40-foot by 1,000-foot by 4,250-foot main turning basin to 1,250 feet;

Widening the 40-foot by 400-foot main channel to 600 feet from mile 0 to mile 1.8, and to 500 feet from mile 1.8 to mile 6.69 at its intersection with the main turning basin;

Provision of a barge mooring area on the east side of the present Texas City main turning basin; and

Reimbursement of \$131,000 to local interests for enlargement of that portion of the 34-foot by 200-foot channel within the authorized project dimensions of the Industrial Canal.

Local interests have indicated willingness to cooperate in the desired improvements.

7. Improvements proposed.--The District Engineer finds that existing and prospective commerce moving over the Industrial Canal is sufficient to justify enlargement of the channel to a depth of 40 feet and to widths of 250 to 350 feet, and that the benefits of such improvement would accrue to the general commerce of the United States. Enlargement of the Industrial Canal would include deepening of the locally dredged turning basin to 40 feet over a width of 1,000 feet and a length of 1,150 feet. The District Engineer also finds that widening of a portion of the Texas City main turning basin to 1,200 feet would be justified to permit its use with reasonable safety and convenience by fully loaded tankers in the 38,000-dead weight ton (d.w.t.) class and light-loaded tankers in the 53,000-d.w.t. class. This turning basin would be shifted 35 feet to the east to provide a 75-foot width from the face of wharves and structures. The District Engineer also finds that the desired enlargement of the 400-foot wide main channel would not realize

sufficient additional benefits to justify its construction at this time and that provision of a barge mooring area on the east side of the main turning basin is not warranted. In addition to the improvements proposed, the District Engineer recommends reimbursement of \$122,000 to local interests for enlargement of that portion of the 34-foot by 200-foot Industrial Canal constructed by them within the authorized, but undredged, project dimensions of the shallow-draft Industrial Canal. He further proposes that all portions of the shallow-draft Industrial Canal and turning basin not incorporated in his plan of improvement be deauthorized.

8. Costs and justification.--Based on February 1970 prices, the District Engineer estimates the total construction cost of the proposed improvements at \$1,753,000, of which \$1,675,000, including \$49,000 for aids to navigation, would be Federal and \$78,000 would be non-Federal. In addition, he recommends reimbursement of \$122,000 to local interests for dredging within the Federally authorized project. Annual charges are estimated at \$137,600, including \$37,300 for Federal maintenance and operation in addition to that now required for Texas City Channel, based on a 50-year project life and an interest rate of 4-7/8 percent. It is estimated that the recommended improvements would provide average annual benefits of \$416,400, consisting of \$364,200 in savings in transportation costs and \$52,200 for reduction in navigation hazards. The benefit-cost ratio is 3.0. The District Engineer recommends the improvements in accordance with his plan, subject to certain requirements of local cooperation. The Division Engineer concurs.

9. Public notice.--The Division Engineer issued a public notice stating the recommendations of the reporting officers and affording interested parties an opportunity to present additional information to the Board. No communications have been received.

Views and Recommendations of the Board of Engineers for Rivers and Harbors.

10. Views.--The Board of Engineers for Rivers and Harbors concurs in general in the views and recommendations of the reporting officers. The Board notes that extensive terminal development will require vessel berths adjacent to the existing main channel and turning basin and the Industrial Canal. For the size and type of vessels contemplated, berthing areas of 125-foot width are desirable. To prevent future encroachment on the project

channels, the berthing area width should be specified and no structures should be permitted within 125 feet of the channel lines. This will require shifting the main turning basin eastward a distance of 85 feet in lieu of 35 feet as proposed in the report of the District Engineer and will increase the Federal first cost by \$110,000.

11. The Board notes that by the year 2025 the Industrial Canal is expected to pass 8,800,000 tons annually of deep-draft vessel traffic and possibly a greater volume of barge traffic. The Board believes that a minimum channel width of 300 to 400 feet should be provided in the Industrial Canal for the safety and ease of navigation. These dimensions are provided in Alternative Plan III as described in the District Engineer's report. This will further increase the Federal first cost by \$89,000 and the non-Federal first cost by \$47,000. The total costs, annual charges, benefits, and benefit-cost ratio for Plan III and the shifting of the main turning basin by 85 feet are:

<u>Item</u>	<u>Costs</u>
Federal first cost:	
Construction (Corps of Engineers)	\$2,302,000
Navigation aids	<u>49,000</u>
Subtotal	2,351,000
Non-Federal first cost	<u>125,000</u>
Total project first cost	2,476,000
Federal annual charges:	
Interest and amortization	\$ 126,300
Maintenance dredging	58,200
Navigation aids	<u>4,800</u>
Subtotal	189,300
Non-Federal annual charges	\$ 6,700
Total project annual charges	\$ 196,000
Average annual benefits	\$ 428,800
Benefit-cost ratio	2.2

12. The Board notes that the reporting officers recommend reimbursement to private interests for work performed by them within the limits of the existing Federal project for the Industrial Canal. It is the opinion of the Board that this reimbursement is not warranted because of the benefits that have already accrued through construction of the deepwater channel.

13. The Board strongly urges local interests to establish regulations to insure safe and efficient vessel traffic flow at Texas City.

14. The Board believes that non-Federal first costs for deepening berthing areas properly should be included in the economic analysis. However, their inclusion will not affect the justification of the improvements. The proposed improvements are needed and are economically justified, and the requirements of local cooperation, as amended by the Board, are generally appropriate.

15. Recommendations. --Accordingly, the Board recommends that the existing project for Texas City Channel, Texas, be modified to provide for widening the existing main turning basin to 1,200 feet for a length of 2,700 feet at its present depth of 40 feet, including relocation of the basin 85 feet to the east to permit adequate berthing area width without encroachment on the project channels and basin; and to provide a 40-foot deep channel in the Industrial Canal at widths of 400 feet from mile 7.46 to mile 8.03 and 300 feet from mile 8.03 to mile 9.15, with a turning basin at the head of the Industrial Canal 40 feet deep, 1,150 feet long, and 1,000 feet wide, and easing of the bend at the entrance to the Industrial Canal; generally in accordance with the plan of the District Engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated first cost to the United States of \$2,302,000 for construction and \$58,200 annually for maintenance in addition to that now required, both exclusive of navigation aids; subject to the condition that no dredging shall be done by the United States within 125 feet of any established pierhead line, wharf, or other structure: Provided that, prior to construction, local interests agree to:

a. Provide without cost to the United States all lands, easements, and rights-of-way required for construction and subsequent maintenance of the improvements and for aids to navigation upon request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers

to be required in the general public interest for initial and subsequent disposal of spoil, and necessary retaining dikes, bulkheads, and embankments therefor, or the cost of such retaining works;

b. Hold and save the United States free from damages due to construction and maintenance of the project;

c. Accomplish without cost to the United States such utility and other relocations or alterations as necessary for project purposes;

d. Provide and maintain without cost to the United States depths in berthing areas and local access channels serving the terminals commensurate with the depths provided in the related project areas;

e. Establish regulations prohibiting discharge of pollutants into the waters of the channel by users thereof, which regulations shall be in accordance with applicable laws or regulations of Federal, State, and local authorities responsible for pollution prevention and control;

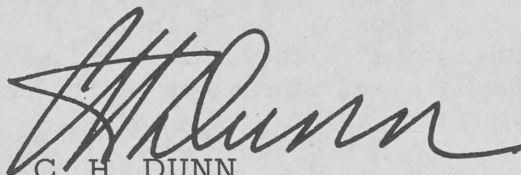
f. Prohibit erection of any structure within 125 feet of the project channel authorized at the time of construction; and

g. Accomplish without cost to the United States removal of barge moorings from the east side of the present Texas City main turning basin.

16. It is recommended further that all portions of the shallow-draft Industrial Barge Canal and turning basin authorized as part of the Federal project for Texas City Channel, Texas, by the River and Harbor Act of 14 July 1960, in accordance with House Document No. 427, Eighty-sixth Congress, Second Session, not incorporated in the plan of improvement recommended above, be deauthorized.

17. The net cost to the United States for the recommended improvement is \$2,302,000 for initial construction and \$58,200 annually for maintenance in addition to that now required, exclusive of navigation aids.

FOR THE BOARD:



C. H. DUNN
Major General, USA
Chairman

REPORT OF THE DISTRICT ENGINEER

REVIEW OF REPORTS TEXAS CITY CHANNEL, TEXAS (INDUSTRIAL CANAL)

SYLLABUS

This report comprises the results of an investigation to determine the advisability of modifying the project for Texas City Channel, Texas, in any way at this time, particularly extension of the deep-draft channel along the alignment of the Industrial Barge Canal. It was found that:

a. Existing and prospective commerce moving over the locally dredged 34-foot by 200 to 250-foot Industrial Canal between mile 7.46 and mile 9.15 is sufficient to justify enlargement of the channel to 40 feet by 250 to 350 feet and that benefits would accrue to the general commerce of the United States.

b. Widening of the 40-foot by 1,000-foot by 4,253-foot main turning basin to 1,200 feet between mile 6.76 and mile 7.27 would be justified to permit the use of fully loaded tankers in the 38,000 d.w.t. class and light loaded tankers in the 53,000 d.w.t. class with reasonable safety and convenience.

c. The requested enlargement of the main Texas City Channel to provide a 40-foot by 600-foot channel from mile 0 to mile 1.8 and a 40-foot by 500-foot channel from mile 1.8 to mile 6.69 would not realize sufficient additional benefits to justify its construction at this time.

Accordingly, it is recommended that the existing project for the Texas City Channel be modified to provide for:

a. Widening a portion of the Texas City turning basin to 1,200 feet.

b. Federal assumption and enlargement through widening and deepening of the locally dredged, deep-draft Industrial Canal and basin; and

c. Reimbursement of \$122,000 to Union Carbide Corporation for enlargement of that portion of the 34-foot by 200-foot Industrial Canal dredged by that company that lies within the limits of the Federally authorized but undredged project dimensions of the shallow-draft Industrial Barge Canal and turning basin.

The estimated first cost to the United States of all recommended new work (exclusive of navigation aids) is \$1,626,000, excluding \$60,000 which has been expended for preauthorization survey and study cost, and the estimated increase in annual maintenance cost is \$37,300 (exclusive of navigation aids). The recommendation is subject to certain provisions of local cooperation.

U. S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

February 18, 1970

SUBJECT: Review of Reports on Texas City Channel, Texas
(Industrial Canal)

THROUGH: Division Engineer
U. S. Army Engineer Division, Southwestern
Dallas, Texas

TO: Chief of Engineers
Department of the Army
Washington, D. C.

INTRODUCTION

1. Scope.- This investigation comprises a study of survey scope to determine the advisability of widening the Texas City Channel and turning basin and incorporating into the project the locally constructed, deep-draft Industrial Canal. Detailed field surveys and office studies were conducted to determine the most practicable plan of improvement. The field investigations consisted of hydrographic surveys to obtain channel cross sections; surveys to obtain data on wharves and other marine terminal facilities; soil borings to obtain subsurface conditions for proposed improvements; and an economic survey to determine the extent and character of benefits that would be derived from the improvements.

2. Purpose of the investigation.- The authorized project for the Texas City Channel provides for a depth of 40 feet from deepwater in Galveston Harbor to and including a turning basin at Texas City; for a dike along the north side of the channel; and for an Industrial Barge Canal with a minimum project depth of 12 feet and a minimum width of 125 feet extending from the main deep-draft turning basin to a shallow-draft turning basin at the inner end of the canal. Extensive industrial and commercial development has occurred on the west side of the main turning basin, along the north side of the Industrial Canal, and around its inner basin. Channel improvements provided by local interests in the Industrial Barge Canal have been adequate for the development of a considerable volume of deep-draft commercial navigation. This investigation was made to determine the extent of prospective traffic and commerce for the waterway, and the advisability of incorporating the locally dredged, deep-draft Industrial Canal into the Federal project and providing improvements for the prospective navigation.

3. Arrangement of report.- The following sections of this report contain the results, conclusions, and recommendations of the Galveston District Engineer, based upon analysis of detailed technical data and investigations in the report appendixes. Arrangement of the appendixes is as follows:

Appendix I - Prior Reports

Appendix II - Economic Evaluation

Appendix III - Engineering Data and Cost Estimates

Appendix IV - Comments by Other Agencies

4. Authority for this investigation.- This review report is submitted pursuant to the following resolution adopted June 23, 1964 by the Committee on Public Works of the United States House of Representatives:

"Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports on Texas City Channel, Texas, submitted in House Document Numbered 427, Eighty-sixth Congress, Second Session, and prior reports, with a view to determining the advisability of modifying the existing project in any way at this time, particularly extension of the deep-draft channel along the alignment of the Industrial Barge Canal."

5. Public hearing.- A public hearing was held in Texas City, Texas on April 14, 1966 to ascertain the views and desires of local interests regarding improvements for Texas City Channel (Industrial Canal). There were 50 persons present including representatives of local governmental agencies, civic groups, and business, commercial and private interests.

6. Improvements desired.- At the public hearing, navigation interests requested that the project for Texas City Channel, Texas, be modified generally as follows:

a. Federal maintenance of the existing locally dredged 34-foot by 200-foot Industrial canal and 34-foot by 1,000-foot by 1,150-foot turning basin at the inner end of the enlarged canal.

b. Reimbursement of \$131,000 to Union Carbide Corporation for enlargement of that portion of the 34-foot by 200-foot canal within the authorized project dimensions of the Industrial Barge Canal.

c. Widening of the 34-foot by 200-foot industrial canal to 300 feet.

d. Deepening of the 34-foot industrial canal and turning basin to 40 feet

e. Widening of the 40-foot by 400-foot main channel to 600 feet between the junction of the main channel with the Houston Ship Channel and the east end of Texas City dike, and to 500 feet between the east end of Texas City dike and the main turning basin.

f. Widening of the 40-foot by 1,000-foot by 4,253-foot main turning basin to 1,250 feet, with easing of the entrance channel to the turning basin as might be found necessary.

g. Further widening of the main turning basin, beyond the 1,250-foot width requested in f, on the east (Snake Island) side at a 12-foot depth to provide a 200-foot wide barge mooring area.

7. In addition to the improvements proposed by the various navigation interests, an attorney, indicating that he represented a large group of persons interested in the operation of the port, requested that the local cooperation requirements for the project include an item that local interests must provide public terminal facilities.

DESCRIPTION

8. General.- The Texas City Channel, located in the southeast part of Texas, is an improved deepwater navigation channel extending west-northwestward from the Bolivar Roads anchorage near Galveston across the lower end of Galveston Bay to a turning basin at Texas City, a distance of about 6.7 miles. The channel connects with the Gulf of Mexico through Bolivar Roads and the Galveston Harbor Channel. Federal project channels are described in paragraph 16. In addition to the project channels, Texas City is served by the Gulf Intracoastal Waterway which crosses the Texas City Channel about 1.5 miles northwest of Bolivar Roads. Plate 1 accompanying this report and United States Coast and Geodetic Survey charts 886 and 1282 show the Texas City Channel and adjacent area. The mean range of tide in Texas City Channel is about 1.3 feet. The water surface in lower Galveston Bay has been depressed as much as 4 feet below mean low tide by strong north winds in the winter season, and has been raised as much as 15 feet above mean low tide by tropical hurricanes which occur in the summer and fall at infrequent intervals.

9. The Union Carbide Corporation has enlarged the Industrial Barge Canal to a depth of 34 feet and a width of 200 feet, dredged a new turning basin 34 feet deep, 1,000 feet wide, and 1,150 feet long, established aids to navigation structures, and constructed terminal facilities for deep-draft commerce.

10. Tributary area.- Texas City, one of the three principal Galveston Bay ports, has a general tributary area comprising the greater part of Texas and parts of adjacent states to the north and west. The immediate tributary area in Texas is well developed in both agriculture and industries. The production of oil and processing of petroleum and petrochemical products are particularly important. The principal agricultural products of the immediate tributary area are grains, cotton, vegetables, fruit, timber, livestock, and dairy products. Minerals include petroleum, natural gas, sulphur, iron ore, industrial chemicals, phosphate rock, building stone, brick and tile clays, seashells, sands and gravel. The principal cities in the Galveston Bay area and their populations are shown in the following table:

TABLE A
POPULATION OF PRINCIPAL CITIES
IN GALVESTON AND HARRIS COUNTIES, TEXAS

City	Population				
	1930	1940	1950	1960	1967 (est) ^{1/}
Houston	292,352	384,514	594,321	938,219	1,187,000
Galveston	52,938	60,862	66,568	67,175	71,000
Texas City	3,534	5,748	16,620	32,065	40,000
Baytown	8,660	10,641	22,983	28,159	44,000
Pasadena	1,647	3,436	22,483	58,737	90,000

^{1/} Texas Community Profiles by Texas Industrial Commission, October 1967.

11. Texas City is principally an oil refining and chemical manufacturing center with three major refineries and four chemical plants located in and near the city. The demand for petroleum products and chemicals for the manufacture of synthetic rubber arising from World War II brought a large expansion of refining capacity and the chemical industry to Texas City. The continued and increasing demand for petroleum products and chemicals has led to further periodic industrial expansion subsequent to World War II. Through the Texas City Terminal Railway Co., the city and port areas have rail service from five major railroad lines. The city is served also with a network of modern highways. Electric power service and fresh water supplies are sufficient to meet the needs of the city and its industries for the foreseeable future.

12. No bridges or tunnels cross the Texas City Channel, turning basin, or Industrial Canal.

13. Prior reports.- This investigation comprises a review of the report on the Texas City Channel, Texas, submitted in House Document No. 427, 86th Congress, 2nd session. Information regarding all prior reports that have been submitted on the Texas City Channel, Texas, is tabulated in appendix I.

14. Previous Corps of Engineers' project.- The original Federal project for the improvement of the Texas City Channel was authorized by the River and Harbor Act of March 3, 1899, which provided for deepening the channel from Galveston Harbor to Texas City to a depth of 25 feet. The channel was first dredged by local interests in 1895-96 to a depth of 16 feet with a bottom width of 100 feet. The River and Harbor Act of June 25, 1910 provided for enlarging the project to dimensions of 30 by 200 feet and extending it to connect with a new locally-dredged slip in front of the wharf at Texas City.

15. Existing Corps of Engineers' project.- The existing project for Texas City Channel was authorized by the River and Harbor Act approved March 4, 1913, and modified by the River and Harbor Acts of July 3, 1930, August 30, 1935, August 26, 1937, June 30, 1948, and July 14, 1960. Details of the various modifications are shown in the tabulation of prior reports, appendix I.

16. The existing project provides for a channel 40 feet deep and 400 feet wide extending about 6.7 miles from deep water in Galveston Harbor to a turning basin 40 feet deep, 1,000 feet wide, and 4,253 feet long at Texas City. The channel is protected on the north side by a pile and clay dike 28,200 feet long reinforced with a parallel rubble-mound dike 27,600 feet long a short distance south of the pile dike. The dike extends from the bay shore for a distance of about 5.2 miles. The project also provides for an Industrial Barge Canal at Texas City 16 feet deep and 125 feet wide for a distance of 1.6 miles, thence 12 feet deep and 125 to 195 feet wide for a distance of 0.3 mile to a turning basin 12 feet deep, 400 feet wide, and 415 feet long. The project has been completed except for the Industrial Barge Canal and turning basin. The need for this work was obviated by enlargement of this facility to the deep-draft dimensions described in paragraph 9 through work performed by the Union Carbide Corporation.

17. The total cost of constructing the existing project to June 30, 1969 was \$5,458,372 as follows:

Federal costs	\$5,429,631
Non-Federal costs	
Contributed funds	<u>28,741</u>
Total construction first cost	\$5,458,372

18. The total maintenance cost of the existing project to June 30, 1969 was \$7,448,081.

19. Annual maintenance costs for the Texas City Channel project currently are estimated at \$300,000. Deepening of the project from 36 feet to 40 feet was accomplished between May 1966 and June 1967. For the 5-year period 1965-69, the amounts expended for maintenance dredging averaged about \$260,000 annually. A maintenance dredging contract was completed in May 1970 at a total cost of \$520,000, an average of \$260,000 for the 2-year period following the last prior dredging completed in May 1968. The experienced maintenance dredging costs are considered to be normal and comparable to those of similar projects. Incremental deepening from the 36-foot depth to 40-foot depth appears to have had little, or no, effect on shoaling rates in the waterway. A total of \$726,158 was expended toward rehabilitation of the Texas City Dike in 1964 by restoring it to design dimensions with improved foundation support. The overall maintenance requirements of this facility should be substantially less in future years. With the increasing problems relative to disposal of spoil material and the increasing costs of maintenance work, the current estimate of \$300,000, which includes \$275,000 for maintenance dredging and \$25,000 for maintenance of the dike, is considered necessary for adequate maintenance of the existing project.

20. Local cooperation on existing and prior projects.- In 1906, the Texas City Transportation Co. dredged the Federal project channel to a depth of 25 feet and also dredged a turning basin and slip at Texas City, all at a cost of \$330,670. In compliance with the authorizing acts, the city of Texas City set aside suitable rights-of-way through the city to be available to any railroad or railroads that might at any time be authorized by the United States to occupy or operate over the dike, and contributed \$28,740 toward the cost of an extension to the turning basin.

21. The authorized Federal project for Texas City Channel, Texas, is subject to the condition that local interests furnish all necessary rights-of-way and spoil disposal areas, hold and save the United States free from damages from construction and subsequent maintenance, and accomplish without cost to the United States all necessary alterations to existing improvements when and as required for construction and maintenance of the project. All requirements of local cooperation have been complied with except those pertaining to the shallow-draft Industrial Barge Canal and turning basin authorized by the River and Harbor Act of July 14, 1960, in accordance with House Document 427, 86th Congress, 2nd Session. Since the need for construction of this improvement was obviated by construction of the deep-draft facilities along the same general alignment by the Union Carbide Corp. as discussed in paragraphs 9 and 16, no local agency has been requested to furnish local cooperation for this improvement.

22. Other improvements.- No Federal funds have been expended for construction or maintenance of the Industrial Barge Canal which was incorporated into the Texas City Channel, Texas, project by the River and Harbor Act of July 14, 1960. In 1948 the Texas City Terminal Railway Co. dredged the barge canal 12 feet deep, 80 to 150 feet wide, and about 2.1 miles long to a turning basin about 400 feet square. The cost of this work was about \$248,000. In 1964 the Union Carbide Corp. enlarged the Industrial Barge Canal and turning basin to the deep-draft dimensions described in paragraph 9. The total cost of enlarging the Industrial Canal was reported to be about \$1,800,000, including the costs for navigation aids consisting of six channel markers and two range lights.

23. In addition to the above improvements, local interests have dredged and maintained the areas between wharves and the Federal project channels, have dredged slips and spur channels at various locations along the channel and turning basin, and have constructed additional terminal facilities for the movement of deep-draft commerce.

COMMERCE AND TRAFFIC

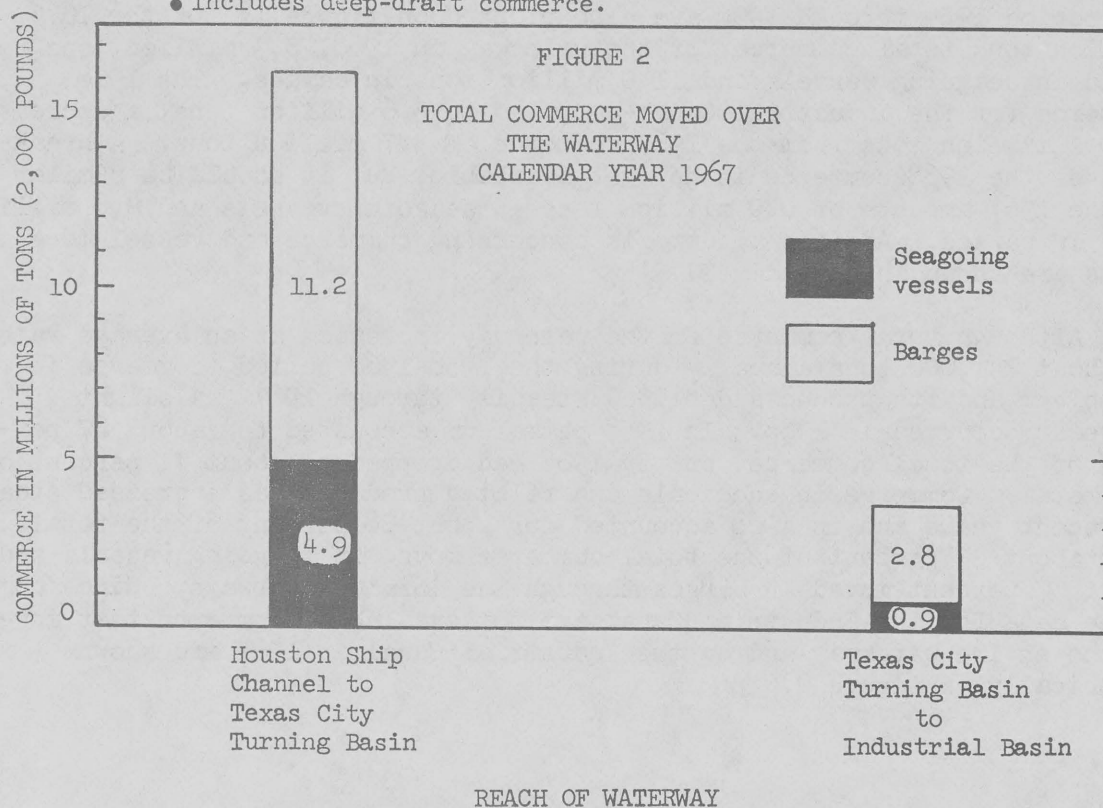
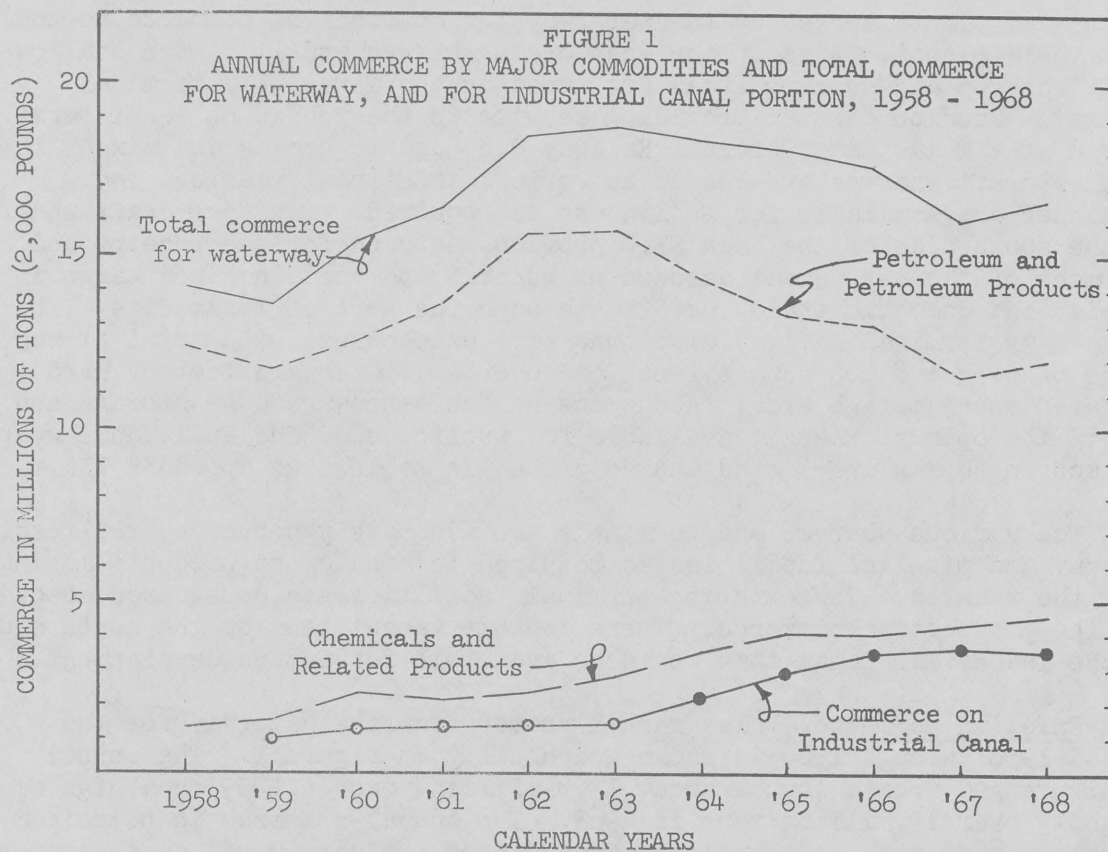
24. Terminal and transfer facilities.- The Texas City Harbor area is served by 38 wharves and mooring areas, including 11 for deep-draft vessels and 27 for barges, towboats, and service equipment. Nine of the deep-draft wharves are located along the main turning basin or along slips connecting with the turning basin. Two are on the Industrial Canal and turning basin. Six of the deep-draft wharves and 16 of the shallow-draft wharves and mooring areas are owned and operated by the various

industrial plants served by the waterway for movement of commerce to and from their plants. Five of the deep-draft wharves and 11 of the shallow-draft wharves and mooring areas are owned by the Texas City Terminal Railway, a common carrier providing service to the public on equal terms. Four of the Texas City Terminal Railway deep-draft wharves and six of the shallow-draft wharves are leased to various industrial plants. The remainder are available for public use as required. One deep-draft wharf on the south side of the Main Slip provides service for the receipt and shipment of the very small amounts of general and containerized cargo in foreign and domestic trades handled through the port of Texas City. The Texas City Terminal Railway also owns five warehouses, with total storage space of over 108,000 square feet, and over 10,000 square feet of hard surfaced open storage area. About one-half of the warehouse storage and all of the open storage is available for public use. The individual wharves and mooring areas are listed and described in table G of appendix III.

25. The various wharves and terminals are adequately served by railroad, highway and pipeline facilities as required to handle the products moving over the wharves. The existing terminal facilities are considered adequate for the prospective commerce. There is some vacant land on the north side of the Industrial Canal that would be available for future development.

26. Existing commerce.- The annual commerce on the waterway for the period 1958 through 1968 is shown graphically in figure 1. The annual totals ranged from a low of about 13.6 million tons in 1959 to a high of slightly over 19 million tons in 1963. The annual commerce in petroleum, petroleum products, and chemicals and related products moved on the waterway during the period and total commerce moved on the Industrial Canal for the period 1959 through 1968 are also plotted on figure 1. Of the 16.7 million tons total commerce for the waterway in 1968, 5.7 million tons moved in seagoing vessels and 11.0 million tons in barges. The 1968 commerce for the Industrial Canal amounted to 3.6 million tons, a decrease of 0.1 million tons from the 1967 commerce of 3.7 million tons. A breakdown of the 1968 commerce is not yet available, but it should be similar to the 1967 amounts of 0.9 million tons in seagoing vessels and 2.8 million tons in barges. Additional details concerning commerce and vessel movements are shown in appendix II.

27. Although total commerce on the waterway increased at an average rate of about 241,000 tons annually during the 1958-1968 period, commerce in petroleum and its products declined steadily through 1967. A slight increase occurred in 1968. In 1958 petroleum accounted for about 87 percent of the total commerce, but by 1968 had dropped to about 71 percent of the total. Commerce in chemicals and related products has increased steadily in recent years and in 1968 accounted for about 28 percent of the total. In 1968 about 33 percent of the total commerce moved in seagoing vessels and about 67 percent moved in barges through the inland waterways. Since complete data for the Industrial Canal are not available, commerce that moved on the entire waterway and on the Industrial Canal in 1967 are shown graphically on figure 2.



28. Prospective commerce.- The Texas City area has a well developed industrial economy based on production and refining of petroleum and manufacturing of petrochemical products. The waterway handles large volumes of both deep and shallow-draft commerce. Since all components of the waterway are adequate for barge commerce, the improvements considered in this report concern only deep-draft commerce and benefits that would accrue from the use of large tankers or bulk carriers. Accordingly, the prospective commerce on the waterway has been estimated separately to identify the portion that would move in deep-draft vessels and in shallow-draft vessels.

29. With the total commerce ranging from a low of about 13.6 million tons to a high of about 19 million tons in the period 1958-1968, the percentage of deep-draft commerce has been declining in recent years, reaching a low of about 30 percent of the total in 1967. Foreign commerce has also diminished and, except for imports and exports of chemicals, now represents only a small fraction of the total. For many years petroleum and its products were the principal items of commerce and, although showing a decline in recent years, still comprise the major commerce on the waterway. Commerce in chemicals and chemical products, which were only minor commodities a few years ago, has increased rapidly and now represents a substantial portion of the total waterway commerce. After the year 2000, chemicals are expected to supplant petroleum and petroleum products as the major waterway commodity.

30. Prospective commerce - petroleum and petroleum products.- The petroleum refineries at Texas City have almost continuous construction programs for plant facilities. Many of the new facilities are for increased plant efficiency and quality of products or for changing to newer types of products. Overall, however, there has been a gradual increase in production capacity and total output. For feed stocks, the Texas City refineries are oriented both to pipeline deliveries of crude from inland fields and to barge deliveries through the Gulf Intracoastal Waterway from coastal and offshore sources. Even with the declining petroleum commerce of recent years, inbound barge movements have continued to rise. The overall decline has resulted mostly from a sharp drop in outbound seagoing movements of petroleum products. This probably reflects the diversion of substantial amounts of products, formerly shipped by tanker to the east coast, to the several large diameter products delivery pipelines, which have been placed in service over the past several years. With the smaller tankers in general use a number of years ago, large diameter pipelines offered a more economical means of transporting liquid products to eastern markets. However, since much larger tankers have come into general use, most of the economic advantage of the pipelines has been lost for areas that can be served by the larger tankers. The Texas City refineries make large shipments to the east coast and it is considered likely that the decline of recent years in deep-draft products shipments is temporary. The long range trend of such shipments should increase, although at a rate considerably below the projected increase in national demand for petroleum and petroleum products. Based on projection factors set forth in the Area Economics Study of appendix II, it is

expected that by the year 2025, petroleum commerce on the Texas City Channel will amount to about 21.9 million tons annually. With increasing use of the larger tankers, the proportion of seagoing commerce is expected to increase gradually to about 45 percent of the total petroleum commerce by the year 2025. The present ratios for inbound and outbound commerce are expected to remain about the same, with inbound commerce accounting for about 75 percent of the total petroleum barge commerce and outbound shipments accounting for about 90 percent of the total seagoing petroleum commerce. The projected prospective commerce in petroleum and petroleum products is shown in table B. The projections of commerce and benefits in this study were based on evaluation of existing commerce through 1967. Subsequently, data on 1968 commerce on the waterway became available. Comparisons indicated that the projections would not be affected by the additional data for 1968 and no changes were made for this reason. All of the seagoing petroleum commerce and a large part of the barge movements are expected to be handled through terminal facilities on the Texas City turning basin.

TABLE B
TEXAS CITY CHANNEL, TEXAS
PROSPECTIVE COMMERCE IN
PETROLEUM AND PETROLEUM PRODUCTS
(Tons - 2,000 pounds)

Year	:	Seagoing	:	Barge	:	Total
<u>1/</u>	:		:		:	
1967		3,463,755		8,127,771		11,591,526
1975		4,204,594		8,893,830		13,098,424
1980		4,603,296		9,179,028		13,782,324
2000		6,520,059		10,415,160		16,935,219
2020		9,077,371		11,694,644		20,772,015
2025		9,832,512		12,017,514		21,850,026

1/ Actual commerce

31. Prospective commerce - chemicals and chemical products.- Growth in the chemicals industry is the most promising of all industrial growth in the area. In addition to petroleum derivatives, large quantities of natural gas and other hydrocarbons are used as basic feed stocks for the industrial plants. The industrial plants producing chemicals are expanding plant

production capacities continuously and several new plants have located in the area in recent years. Movements of chemicals and related products on the waterway have increased steadily, reaching a total of about 4.3 million tons in 1967 and increasing to 4.6 million tons in 1968. The chemical commerce rose sharply after deep-draft shipments were started from the Industrial Canal in 1964. The deep-draft chemical commerce on the waterway in 1967 totaled about 1.2 million tons, of which about 24 percent were foreign shipments and about 76 percent coastwise. Of the total 1.2 million tons, deep-draft shipments on the Industrial Canal accounted for 956,000 tons. Of the slightly over 3 million tons of barge shipments, about 54 percent were inbound and about 46 percent outbound. Based on projection factors set forth in the Area Economic Study of appendix II, it is expected that by the year 2025, chemical commerce on the Texas City Channel will amount to about 39.2 million tons annually. The ratios of seagoing to barge commerce, inbound to outbound commerce, and foreign to coastwise seagoing commerce are expected to remain about the same as at the present time. The projected prospective commerce in chemicals and chemical products is shown in table C. About 80 percent of the projected seagoing chemical commerce is expected to be handled on the Industrial Canal, with the remainder handled through terminal facilities on the Texas City turning basin. The barge commerce will be handled in both areas.

TABLE C

TEXAS CITY CHANNEL, TEXAS

PROSPECTIVE COMMERCE IN
CHEMICALS AND CHEMICAL PRODUCTS
(Tons - 2,000 pounds)

Year	Seagoing		Barge	Total
	Industrial canal	Texas City turning basin		
1967 ^{1/}	956,000	271,806	3,031,941	4,259,747
1975	1,315,000	374,000	4,172,000	5,861,000
1980	1,591,000	452,000	5,045,000	7,088,000
2000	3,403,000	968,000	10,794,000	15,165,000
2020	7,280,000	2,070,000	23,088,000	32,438,000
2025	8,803,000	2,503,000	27,918,000	39,224,000

^{1/} Actual commerce

32. Prospective commerce - other commodities.- Relatively small amounts of a number of other commodities are moved on the Texas City Channel, including the Industrial Canal. While the aggregate totals of these commodities vary from year to year, the average is on the order of 0.5 million tons. The only such commodities of consequence are inbound movements of marine shell and phosphate rock and small imports of non-ferrous ores for a smelter at Texas City. In 1967, movements of these three commodities included about 76,000 tons of marine shell, about 148,000 tons of phosphate rock, and about 14,000 tons of nonferrous ores. All other miscellaneous commodities accounted for only about 22,000 tons. The phosphate rock is brought in by both seagoing and inland waterway barges to be processed into agricultural fertilizer, while the marine shell is brought in by barge for road materials. For these commodities there is no apparent basis for forecasting appreciable increases in future years. Accordingly, it is considered that a reasonable estimate of commerce in miscellaneous commodities would be about 0.5 million tons annually throughout the project life, including about 200,000 tons of seagoing commerce and 300,000 tons of barge commerce.

33. Summary of prospective commerce.- The total estimated prospective commerce for the Texas City Channel, including the Industrial Canal is summarized in table D. The distribution of the deep-draft commerce between terminals on the Texas City turning basin and the Industrial Canal and basin is shown in table E.

34. Existing vessel traffic.- The present vessel traffic on the waterway, including the trips and drafts of all self propelled vessels and their direction of movement for calendar year 1967, is summarized in table 4 of appendix II. For study purposes the pattern of deep-draft traffic to the main turning basin at Texas City and beyond to the locally constructed Industrial Canal and Basin were determined. Table F is a summary of trips by vessels with drafts greater than 19 feet in calendar year 1967. The data in table F covers deep-draft tankers, bulk carriers, and cargo vessels. The total of 767 one-way trips includes arrivals or departures by vessels with loaded drafts greater than 30 feet. These vessels were mostly tankers of 18,000 deadweight tons and greater. Of the 135 trips of seagoing vessels on the Industrial Canal, round trips were made by 26 vessels with design drafts of more than 30 feet.

TABLE D

PROSPECTIVE COMMERCE IN SELECTED YEARS
FOR TEXAS CITY CHANNEL
(INCLUDING INDUSTRIAL CANAL)

(In millions of tons - 2000 pounds)

Year	Petroleum		Chemicals		Other		Totals		Total
	Seagoing	Barge	Seagoing	Barge	Seagoing	Barge	Seagoing	Barge	
1967 ^{1/}	3.464	8.128	1.228	3.032	0.189	0.081	4.881	11.241	16.122
1975	4.205	8.894	1.689	4.172	0.200	0.300	6.094	13.366	19.460
1980	4.603	9.179	2.043	5.045	0.200	0.300	6.846	14.524	21.370
2000	6.520	10.415	4.371	10.794	0.200	0.300	11.091	21.509	32.600
2020	9.077	11.695	9.350	23.088	0.200	0.300	18.627	35.083	53.710
2025	9.833	12.018	11.306	27.918	0.200	0.300	21.339	40.236	61.575

^{1/} Actual commerce for year 1967

TABLE E

PROSPECTIVE SEAGOING COMMERCE FOR
TEXAS CITY CHANNEL
BY SECTION OF WATERWAY
(Tons - 2,000 pounds)

Year	Industrial Canal and basin	Texas City turning basin	Total
1967 <u>1/</u>	956,000	3,925,000	4,881,000
1975	1,315,000	4,779,000	6,094,000
1980	1,591,000	5,255,000	6,846,000
2000	3,403,000	7,688,000	11,091,000
2020	7,280,000	11,347,000	18,627,000
2025	8,803,000	12,536,000	21,339,000

1/ Actual commerce

TABLE F

ONE-WAY TRIPS BY VESSELS WITH
DRAFTS GREATER THAN 19 FEET
CALENDAR YEAR 1967

Draft in feet	Design	Actual	Houston Ship Channel to Texas City turning basin Actual
38	0	0	1
37	0	0	4
35 & 36	0	0	24
33 & 34	9	4	88
31 & 32	17	14	131
29 & 30	85	36	102
27 & 28	7	19	51
25 & 26	5	19	50
23 & 24	3	13	90
21 & 22	3	11	129
19 & 20	<u>6</u>	<u>19</u>	<u>97</u>
Totals	135 <u>1/</u>	135 <u>1/</u>	767 <u>2/</u>

1/ Source: Reported by local interests.

2/ Source: Waterborne Commerce of the United States - 1967.
See table 4 of appendix II.

35. Prospective vessel traffic.- For analysis of the prospective use of supertankers and bulk carriers on the Texas City Channel and on the locally constructed Industrial Canal, a study was made to determine the present numbers and sizes of such vessels in the United States and foreign fleets, and the probable change in composition of the two fleets in future years. The study, described in paragraphs 16 through 18 of appendix II, indicates that the rapid trend in the last few years to large size vessels will continue, and that tankers in excess of 18,000 dwt (30-foot loaded draft) will be required to transport the prospective chemical commerce on the Industrial Canal during the 50-year project life period of the proposed improvements. In 1967 with total deep-draft commerce of about 4.9 million tons, 767 one-way vessel trips with drafts of 30 feet or greater were reported for the waterway. With the increasing trend toward the larger tankers, the number of vessel trips is not expected to increase as rapidly as the commerce, since the load transported by each vessel will increase in the future. Based on the prospective commerce and the increasing size of the vessels, it is estimated about 1,400 vessels with drafts greater than 30 feet will transit the waterway annually by the year 2000 and by the year 2025 this number will have increased to about 2,000 vessels. No estimates were made of the prospective traffic by shallow-draft vessels, since the existing waterway is adequate for these vessels.

DIFFICULTIES ATTENDING NAVIGATION

36. Difficulties attending navigation.- Some difficulties in navigation are being experienced on the main channel of the waterway. At times strong crosswinds or fog may delay or stop traffic completely for short periods. The mix of large seagoing vessels and very heavy barge traffic also contributes difficulties, particularly during periods of adverse weather. Occasionally, inbound tankers in ballast run aground in attempting to meet or pass a long tow of barges with strong crosswinds. The present 40 by 400-foot project for the main channel is adequate for the meeting or passing of one large tanker of up to 38,000 dwt with loaded drafts of 36 feet and a smaller tanker. In 1967 only 11 trips were made on the waterway by vessels loaded to drafts of 36 feet or more. With respect to the difficulties between barge traffic and seagoing traffic, it is not considered that widening of the main channel would necessarily relieve the problem. If the vessels are under full control and proceeding with proper alignment in the channel, no difficulties should be experienced in a 400-foot wide channel. The difficulties usually arise when control is lost either by the tow or the large vessel or both, and they become misaligned in the channel. Adverse winds or currents, lack of sufficient power, careless handling, and other reasons contribute to such difficulties. Experience has shown that those same types of difficulties are experienced on other channels in the district having widths greater than 400 feet.

37. The principal difficulties in navigation are being experienced within the main turning basin at Texas City. The authorized project width of 1,000 feet for the main turning basin at Texas City is designed to provide for the turning of a supertanker with lengths of about 665 feet or greater.

Some longer vessels are now using facilities in the basin and the number of these vessels is expected to increase in the future. The larger vessels can be maneuvered in the existing turning basin only with extreme care and caution, particularly with the occasional congested traffic of barge tows and deep sea vessels. The existing bottom edge of the west side of the main turning basin is 40 feet from the harbor line. In 1964-1965, a new supertanker wharf was constructed at the harbor line. Under current policies, in turning basins with loading terminals along their perimeters, it is customary to perform no project dredging within 75 feet of an existing structure or wharf, since such areas are considered to be berthing areas. Thus, opposite the new supertanker wharf the effective width of the existing turning basin would be reduced from 1,000 feet to 965 feet. In the past navigation difficulty in the main turning basin was compounded by barges moored on the slope of the east (Snake Island) side of the basin. Mooring facilities for 8 barges were constructed on Snake Island under a Department of the Army permit to a local oil company at Texas City. Mooring of single barges along the slope should not interfere with turning deep-draft vessels in the basin. It has been reported, however, that on occasion the mooring facilities were used by up to a dozen or more barges at one time, with some being moored in a manner that would permit them to swing out into the basin. The mooring facilities have been damaged from time to time and appear to be of little value. Since hazards are created by their existence and use, it is considered that the remainder of the facilities should be removed.

38. Difficulties in navigating large vessels in the sharp bend at the entrance to the Industrial Canal also are being experienced. Vessels entering and leaving the Industrial Canal are required to operate at dead slow speed and are aided by tugs at the bow and at the stern. This channel entrance should be flared and eased in addition to the basin widening mentioned in the preceding paragraph. The existing width of 200 feet for the locally dredged Industrial Canal is adequate for one-way traffic of tankers up to about 25,000 dwt. However, the Industrial Canal is frequently used by vessels up to 30,000 dwt. Widening of the Industrial Canal to provide for prospective one-way traffic by loaded vessels up to 38,000 dwt is needed. Difficulties in navigating large vessels in and out of the Industrial Basin at the inner end of the Industrial Canal are also being experienced. The basin entrance should be flared at its junction with the Industrial Canal to facilitate movement of the large vessels. Except for depth, the turning area of the Industrial Basin is adequate for tankers up to about 38,000 dwt, which would accommodate both existing and prospective traffic. Therefore, no widening of this basin is needed.

WATER POWER AND OTHER SPECIAL SUBJECTS

39. General.- The proposed navigation improvements under consideration in this report would have no bearing on water power, flood control, water quality, pollution abatement, irrigation, land reclamation, recreation, aesthetics, or any other purpose involving the control or conservation of water resources except fish and wildlife. The latter purpose is discussed in the following paragraphs.

40. Fish and wildlife resources.- Dredged materials from the work recommended in the plan of improvement would be placed on Snake Island beyond the crests of existing spoil mounds or levees and the discharge water would flow easterly and southerly into Galveston Bay. The proposed spoil disposal areas have been coordinated with the Regional Director of the U. S. Fish and Wildlife Service. In a report, the Regional Director stated that the proposed plan of improvement would neither affect significantly fish and wildlife resources nor offer feasible opportunities for the improvement of those resources. A copy of the Fish and Wildlife Service letter report is contained in appendix IV. Some consideration was given to placing spoil from future maintenance dredging on a marsh area near the north end of Swan Lake. However, the U. S. Fish and Wildlife Service in its report stated that further coordination with the Texas Parks and Wildlife Department and the Bureau of Sport Fisheries and Wildlife would be required prior to future use of that area.

PROJECT FORMULATION

41. General.- The large shipping, storage, and terminal facilities for water commerce in the Texas City Harbor area represent investments totaling many millions of dollars. All of the facilities are located either along the existing deep-draft main turning basin or along the Industrial Canal. No alternatives to channel improvements were considered feasible because of the obviously large costs that would be required for relocation of existing facilities. In determining the most feasible plan of improvement, detailed engineering and economic consideration was given to the following:

a. Widening the main turning basin to accommodate the existing and prospective traffic, and;

b. Incorporating the locally constructed Industrial Canal and basin into the Federal project with deepening and widening to accommodate existing and prospective vessel traffic of tankers.

42. Preliminary investigations were made to determine the need for widening the main channel between the Houston Ship Channel and the main turning basin at Texas City and for constructing a barge mooring area on the east side of the main turning basin. The investigations found no justification for widening the main channel at this time. The existing 400-foot width is sufficient to accommodate fully loaded supertankers up to 38,000 dwt with beams of 93 feet and the passing, or meeting of a tanker of this size with smaller ocean going vessels or barge tows, if reasonable care is maintained in navigating the vessels. Because of the relatively short length, delays caused by two 38,000 dwt or larger tankers desiring to ingress and egress the Texas City Channel at the same time should be of short duration and, for the most part, could be avoided by reasonable scheduling procedures. Only negligible additional benefits would be realized by widening the main channel. Depths greater than 40 feet were not investigated because all deep-draft vessels using the Texas City Channel also must transit either the Houston Ship Channel or the Bolivar Roads and Galveston Inner Bar Channels, which have authorized project depths of 40 feet. A separately authorized study will consider the need for further enlargement and deepening of these channels, as well as all others in the Galveston Bay area. The results of this study will not be known for several years. If the need for additional improvement of the Texas City Channel becomes apparent, it will be further considered in that study. Construction of a barge mooring area on the east side of the main turning basin was not considered in detail because of the lack of apparent need and benefits. The past use of this area appears to have been a matter of convenience for storing barges when they were not in use, rather than an actual need for mooring barges in service. Barges stored or moored in this area present hazards to large vessels turning or maneuvering in this basin and it is considered that the use of the area should be discontinued. The fact that the locally installed mooring facilities have been allowed to deteriorate to the point of virtual uselessness indicates no great need for such a facility. There

appears to be adequate facilities for handling barges currently in use at the several barge terminals along the turning basin and in the Industrial Canal. A request for the restoration and maintenance of the existing locally dredged 12-foot deep trapezoidal area separating the Industrial Basin (Basin "A") and Basin "B" between mile 9.37 and mile 9.42 of the Industrial Canal was considered. With construction of the Industrial Basin, which is adequate for a barge turning basin as well as serving the large seagoing vessels, the trapezoidal area now functions primarily as a mooring and berthing area for the barge traffic. There appears to be no justification for maintaining this area as part of the Federal project and no detailed investigation was made of the proposal.

43. Plans considered.- Each proposed improvement was considered with respect to its adequacy to serve the needs of prospective commerce for the project. The existing dimensions of the main turning basin at Texas City are considered adequate to accommodate the largest dry cargo vessel that is likely to call at that port. The turning difficulties at this location are experienced principally by the large tanker vessels. For all practicable purposes, the benefits to be derived from the improvements considered would accrue to tankers and bulk carriers of 38,000 dwt and greater. Accordingly, formulation of a plan for improvements to the existing project is concerned primarily with two separate portions of the waterway. Improvements considered for the two portions were: (a) widening of the main turning basin to fully accommodate the larger supertankers, and (b) incorporation of the locally constructed deep-draft Industrial Canal and basin into the Federal project with enlargement by widening and deepening as required to fully accommodate the prospective traffic in supertankers. Various increments of additional width were analyzed in conjunction with the prospective commerce and traffic to determine the costs and benefits associated with each increment. The locations and dimensions of improvements investigated for various plans are shown on plate 3 of this report.

44. Environmental resources development considerations.- The main turning basin of the Texas City Channel project and the locally dredged Industrial Canal and turning basin are the areas being considered for improvement. Excepting two small areas shown on plate 2, the Industrial Canal and turning basin occupy the entire area of the Industrial Barge Canal and turning basin portion of the project which was authorized in 1960 but was not constructed prior to dredging of the deep-draft Industrial Canal and turning basin by the local interests. Both the main turning basin and the Industrial Canal are adjacent to the industrial section of Texas City. There are no recreational boating or other recreational activities in this vicinity and it is not considered likely that such activities will develop in the future. There are ample opportunities for all forms of water oriented recreation in the waters of Galveston Bay and along the Texas City dike, including adequate service facilities to satisfy the current demands. Additional facilities can easily be provided in the general Texas City area to satisfy all demands likely to

develop in the foreseeable future. Accordingly, no improvements for recreational use were considered in connection with the proposed improvements to the main turning basin and the Industrial Canal.

45. The proposed spoil disposal areas along the Industrial Canal and on Snake Island are not susceptible to either recreational use or beautification for aesthetic considerations. The areas are not readily accessible to visitors or visible to the general public. The continuing need for use of the spoil disposal areas for future maintenance dredging makes any long range program for beautification impracticable.

46. At the public hearing, a request was made that the local cooperation requirements for any improvements include the provision of public terminal facilities. When the request was made, the presiding officer at the public hearing advised local interests that the request would be considered and suggested that specific information be furnished relative to the need for an additional public facility. No additional supporting data were received. The existing public terminal facilities at Texas City are open to all on equal terms and appear to be adequate to meet the needs of prospective commerce. Accordingly, this request was not considered further.

47. An analysis of channel and basin dimensions required for various sizes of tanker vessels is given in appendix III. This analysis shows that for full loading, a depth of 34 feet is required for 18,000 dwt vessels, a depth of 40 feet for 38,000 dwt vessels, and a depth of 43 feet for 53,000 dwt vessels. An analysis of the existing and prospective commerce on the Industrial Canal determined that the locally constructed depth of 34 feet is not adequate for the prospective use by supertankers. A number of vessels are operating light-loaded on this facility now. With the rapidly increasing prospective commerce in chemicals and chemical products and the existing and prospective use by tankers of 38,000 dwt and larger, it was determined that this facility should be deepened to 40 feet. A depth greater than 40 feet was not considered since this is the presently authorized depth in Bolivar Roads and the Galveston Inner Bar Channel which must be transited by all sea-going traffic bound for Texas City. The vessels that would benefit from an increase in channel depth from 34 to 40 feet are those ranging from 18,000 dwt to 53,000 dwt. Therefore, the 18,000 dwt vessel, the 38,000 dwt vessel, and the 53,000 dwt vessel were selected as design vessels. Based on the general characteristics of the design vessels, a channel width of 250 feet is required for one-way traffic, and a channel width of 400 feet is required to permit the safe passage of loaded vessels. A turning basin for 53,000 dwt vessels, with lengths of about 760 feet should have an available turning diameter of 1,200 feet. A turning basin for 38,000 dwt vessels, with lengths of 695 feet should have an available turning diameter of 1,000 feet.

48. Based upon the prospective commerce in chemicals and chemical products, it was determined that the Industrial Canal would be used extensively by tankers of up to about 38,000 dwt and that the channel should provide for traffic by such vessels. Also, traffic density in the main turning basin at Texas City would be sufficient to require widening to provide for turning by vessels of up to 53,000 dwt. At this time, enlargement of the Industrial Canal basin to provide for turning vessels larger than 38,000 dwt is not indicated.

49. Comparison of plans.- Based on the foregoing considerations, three plans were selected for comparison. All three plans include widening of the main turning basin at Texas City. This basin is now 40 feet deep, 1,000 feet wide and 4,253 feet long. The proposed widening would provide a width of 1,200 feet along a distance of 2,700 feet and the basin would be shifted 35 feet eastward from its present position. The three plans differ only in project dimensions investigated for the locally constructed Industrial Canal and basin. Plan I would provide only for maintenance of the locally dredged Industrial Canal and basin to its existing dimensions. This provides a depth of 34 feet, widths ranging from 200 feet to 250 feet in the Industrial Canal, with a width of 1,000 feet and a length of 1,150 feet in the Industrial Basin. Plan II would provide for deepening the Industrial Canal and Basin to 40 feet and widening the Industrial Canal to provide widths ranging from 250 feet to 350 feet to allow one-way traffic of tanker vessels up to 38,000 dwt. Plan III would provide for deepening to 40 feet and widening the Industrial Canal to provide widths ranging from 300 feet to 400 feet to allow two-way traffic of tanker vessels up to 38,000 dwt. The estimated annual benefits, annual charges, excess benefits over charges, and benefits to costs ratios for the three plans are summarized as follows:

Plan ^{1/}	Annual benefits	Annual charges	Excess benefits over charges	B/C ratio
I ^{2/}	\$37,200	\$37,200	0	1
II	416,400	137,600	\$278,800	3.0
III	422,700	190,700	232,000	2.2

^{1/} In each plan benefits for widening the Texas City main turning basin have been equated to the estimated annual charges of \$37,200.

^{2/} Excludes benefits accruing to existing commerce which have been equated to estimated annual charges of \$114,300 on locally dredged Industrial Canal and basin.

50. Selection of plan.- Selection of the plan of improvement was based on comparison of the plans to determine the optimum scale of development from an economic standpoint. Figure 3 shows curves constructed by plotting the annual benefits, annual charges, and excess benefits over charges for each of the three plans. From an inspection of the curves it may be seen that the benefits would be maximized, or the largest excess of benefits to costs would be obtained, from plan II. When considered separately, all three plans of improvement would have benefits to costs ratios of unity or greater. However, the additional benefits for vessels on the Industrial Canal would not justify construction of a width greater than that required by one-way traffic at this time. The above estimates of annual benefits and annual charges show that additional enlargement of the Industrial Canal from plan II to plan III would have incremental benefits of only \$6,300, incremental costs of \$53,100, and an incremental benefits to costs ratio of only 0.1.

PLAN OF IMPROVEMENT

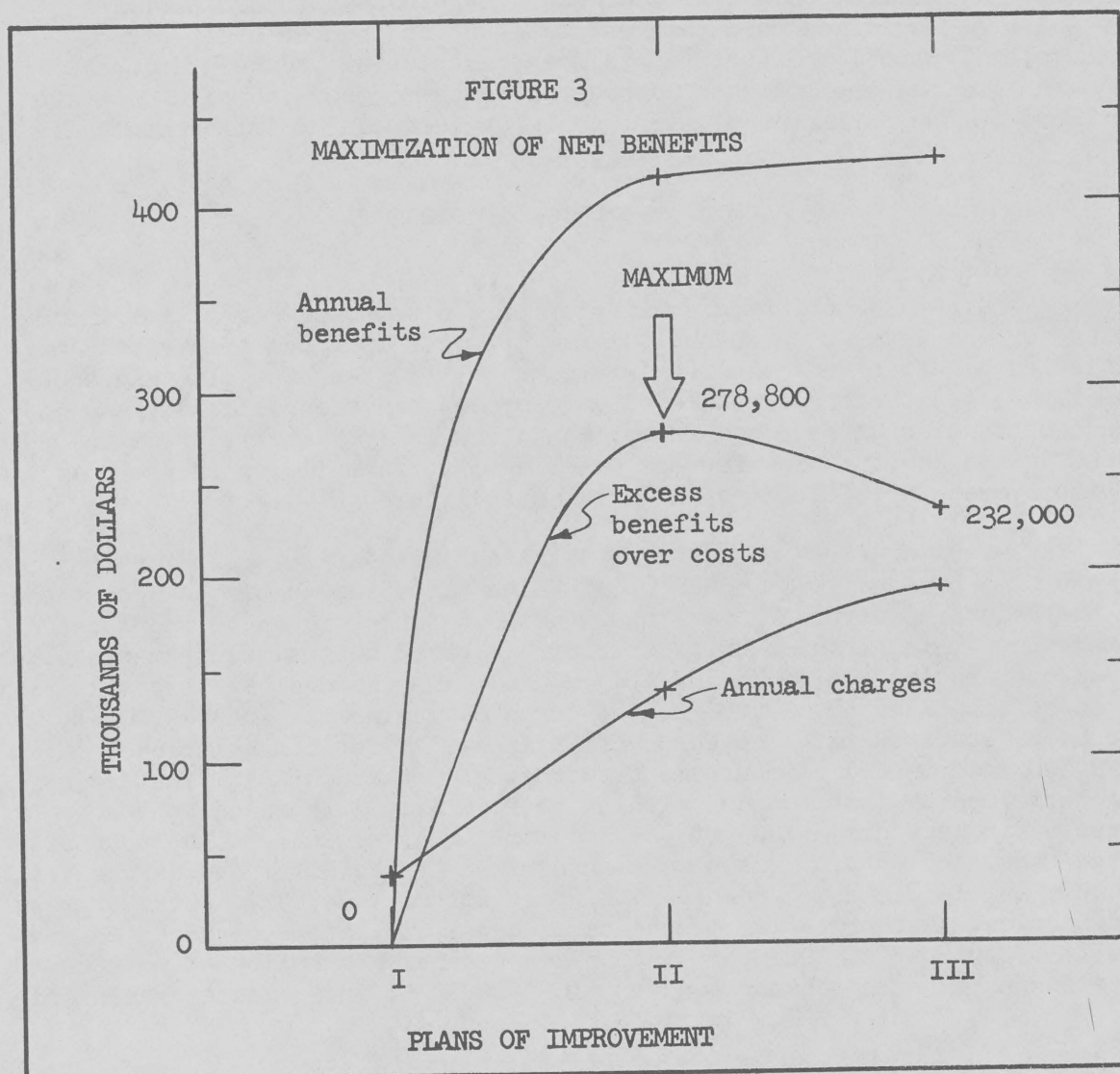
51. Plan of improvement.- The plan of improvement provides for widening of the 40-foot by 1,000-foot by 4,253-foot Texas City turning basin to 1,200 feet, for a distance of about 2,700 feet; for realigning the Texas City turning basin to a location 35 feet easterly from its present position; for enlarging the locally dredged 34-foot by 200 to 250-foot Industrial Canal to 40 feet by 250 to 350 feet between mile 7.46 and mile 9.15; and for deepening the locally dredged 34-foot by 1,000-foot by 1,150-foot (Basin "A") to 40 feet between mile 9.15 and mile 9.35 (except no dredging within 75 feet of wharves or structures). The plan also provides for flaring the entrances to the Industrial Canal and basin and for tangential bend easing of the existing curved entrance to the Industrial Canal. The general plan of improvement is shown on plate 2.

52. The plan of improvement eliminates further need for the authorized shallow-draft Industrial Barge Canal and turning basin which lie substantially within the limits of the deep-draft Industrial Canal and turning basin. Therefore, the shallow-draft features not encompassed by the plan of improvement are recommended for deauthorization. The small portions to be deauthorized are shown on plate 2 and, for the most part, comprise the barge canal basin and its extension. The shore facilities around these areas are privately owned and the areas are considered to be essentially for mooring and berthing and should be maintained by the local interests.

53. All work in the plan of improvement concerns the excavation and disposal of materials. The improvements would require about 25 acres of fast lands and 118 acres of submerged lands for rights-of-way. Excavated material would be placed on the existing Snake Island spoil disposal area,

on the land area between Snake Island and the mainland, and on a 200-acre land area owned by the Union Carbide Corp. adjacent to Loop 197 and 0.3 mile south of the Industrial Basin. Spoil placed on or near Snake Island would be allowed to flow easterly and southerly into Galveston Bay. Spoil placed in the 200-acre area owned by Union Carbide Corp. would be retained.

54. Construction of the plan of improvement would not require alteration of any pipeline or cable crossings. However, removal of eight-barge mooring anchors on the easterly side of the Texas City turning basin would be required. Locations of the barge mooring facilities are shown on plate 2.



SHORELINE CHANGES

55. Shorelines.- The plan of improvement would require removal of about 200 feet of the bank on the easterly (Snake Island) side of the main turning basin and of about 50 feet of the bank along the south side of the Industrial Canal. Spoil placed on Snake Island and on the land area between Snake Island and the mainland would be allowed to flow into Galveston Bay, thereby causing a negligible movement of the shoreline bayward.

AIDS TO NAVIGATION

56. Aids to navigation.- The Commander, Eighth Coast Guard District, New Orleans, Louisiana furnished estimates of the number and types of aids to navigation, and their costs for construction and maintenance, required for the improvements considered in this report. These data are included in the estimates of first cost for the plan of improvement.

ECONOMIC EVALUATION OF PROJECT

57. General.- The economic evaluation of the proposed navigation improvements for the Texas City Channel, Texas, project included comparisons of estimated benefits and costs to insure that: (a) the best plan had been developed, (b) the proper scale of development had been selected, and (c) the construction of proposed improvements was fully justified from an economic standpoint. The factors entering into formulation of the plan of improvement are discussed in paragraphs 41 through 46.

58. Estimates of first cost.- The total estimated first cost for the plan of improvement is \$1,753,000, of which \$1,675,000 would be apportioned to the Federal Government and \$78,000 would be apportioned to the local interests. This division of first costs is based on the requirements of local cooperation set forth in paragraph 64. The Federal first costs would be allocated \$1,626,000 to the Corps of Engineers, and \$49,000 to the U. S. Coast Guard. The Corps of Engineers' first costs include \$122,000 recommended reimbursement to the Union Carbide Corp. for dredging performed by that company within the Federally authorized but unconstructed project dimensions of the Industrial Barge Canal. The Industrial Barge Canal and turning basin were authorized by the River and Harbor Act of July 14, 1960, in accordance with House Document No. 427, 86th Congress, 2nd Session. Authorization of the barge canal and basin consisted essentially of two parts. One part authorized Federal assumption of maintenance for an existing channel, having 16-foot depth in its outer reach and

12-foot depth in its inner reach, and for an existing basin at the inner end of the channel having a depth of 12 feet. The second part authorized Federal construction of channel widening, at depths corresponding to the 16-foot and 12-foot depths in the existing channel, over a width of 45 feet on the south side of the existing channel. The total Federal first cost for the barge canal and basin project as estimated in the House Document was \$131,000. This amount included \$122,000 for canal widening, and \$9,000 for aids to navigation. The deep-draft Industrial Canal and basin were completed by local interests in 1964 at a total cost of \$1,788,630. This amount included costs for three work subfeatures consisting of: (a) dry excavation of about 400,000 cubic yards of material from the channel and basin limits for use as fill in the construction of a tank farm area; (b) hydraulic dredging to construct the 34-foot channel and basin, together with the construction of levees and spillways required for spoil disposal operations; and (c) installation of navigation aids for the new deep-draft channel. The total cost of subfeature (b) was \$1,576,630. This amount included approximately \$1,440,000 for the removal of about 4,800,000 cubic yards of material at unit prices averaging 30 cents per cubic yard. The balance of the costs for subfeature (b) were engineering and administrative costs. Unit prices for the dredging varied slightly, depending upon whether the material was placed in areas requiring confinement, or where no levees were needed. These operations would have been the same for the authorized widening of the barge canal. At the average unit price of 30 cents per cubic yard for dredging subfeature (b), the dredging cost to local interests for widening the barge canal was \$132,000 (440,000 cu. yds. estimated in HD 427/86/2 x \$0.30). This amount exceeds the estimated total Federal first cost of \$122,000 for the authorized canal widening. However, reimbursement of only the latter amount is recommended, since estimates indicate that the work could have been performed by the Federal Government for this amount. A very small quantity of material dredged during the channel widening may have been removed from the inner end of the barge canal now recommended for deauthorization in this report. Accurate survey data for estimating the quantity of such material are not available. However, the dredging costs for its removal would have been insignificant. Accordingly, no reduction in the amount of reimbursement is proposed for this material. For reasons stated in paragraph 76, reimbursement for costs incurred for constructing navigation aids is not recommended. Detailed estimates of the first costs are contained in appendix III. All estimates are based on February 1970 price levels.

TABLE G

ESTIMATES OF FIRST COSTS FOR PLAN OF IMPROVEMENT

Item	Cost
<u>Federal first cost:</u>	
Corps of Engineers	
Dredging	\$1,356,000
Engineering and design	64,000
Supervision and administration	84,000
Recommended reimbursement to Union Carbide Corp. ^{1/}	<u>122,000</u>
Total - Corps of Engineers	1,626,000
U. S. Coast Guard, aids to navigation	<u>49,000</u>
Total Federal first cost	1,675,000
<u>Non-Federal first cost:</u>	
Non-Federal public: lands, rights-of-way, spoil disposal areas, and levees and spillways	76,000
Non-Federal private, relocations	<u>2,000</u>
Total - Non-Federal first cost	78,000
Total first cost	\$1,753,000

NOTE: Estimated first costs shown in table G are exclusive of \$60,000 expended for preauthorization survey and study costs including preparation of this report.

^{1/} Reimbursement in the amount of \$122,000 recommended for dredging authorized Federal shallow-draft Industrial Barge Canal.

59. Estimates of annual charges.- Total annual charges for the plan of improvement are estimated at \$137,600. Detailed estimates of the investments and annual charges are contained in appendix III, and are summarized in table H below. An interest rate of 4.875 percent and a period of 50 years for amortization of the investment were used for computation of annual charges.

TABLE H

ESTIMATES OF INVESTMENTS AND ANNUAL CHARGES
FOR PLAN OF IMPROVEMENT

Item	:	Cost
<u>Investment:</u>		
Federal		\$1,675,000 ^{1/}
Non-Federal		<u>78,000</u>
Total		1,753,000
<u>Annual charges:</u>		
Federal		132,100
Non-Federal		<u>5,500</u>
Total annual charges		\$137,600

^{1/} Includes \$122,000 recommended reimbursement for dredging authorized Federal shallow-draft Industrial Barge Canal

60. Estimates of benefits.- The benefits to be derived from the plan of improvement primarily would be savings in transportation costs resulting from full loading of tankers now operating light-loaded on the locally constructed Industrial Canal and basin and the savings realized from the use of larger vessels than those now operating. The existing dimensions of the locally constructed Industrial Canal are adequate for fully loaded vessels up to 18,000 dwt, and the existing Industrial turning basin is considered adequate for vessels up to 38,000 dwt except for insufficient depth. The Industrial Canal is now being used by tankers up to about 24,000 dwt operating lightloaded. The proposed deepening of the Industrial Canal and basin to 40 feet and the proposed widening of the Industrial Canal would permit fully loaded operation by tankers of up to 38,000 dwt. An analysis of the operation costs by large tankers on the Industrial Canal of from 18,000 dwt to 53,000 dwt is presented in appendix II. This analysis was used to determine the savings that would result from movement of the prospective commerce by combinations of various sizes of larger vessels fully or partially loaded - together with the smaller vessels that still would be employed in such commodity movements. With the waterway improved as proposed in the plan of improvement it was found that average savings in transportation costs of from about 57 cents to 69 cents per ton would be realized, depending upon destination, for chemicals and chemical products.

61. Based on estimated amounts of the prospective commerce that would be moved during various periods of the 50-year period of analysis, average annual equivalent benefits from savings in transportation costs were determined. For benefits computed on the coastwise trade between the project and other ports of the United States, only one-half of the benefits were credited to the improvements to the Industrial Canal. For the foreign trade, where the deep-draft commerce generally is handled at ports having adequate natural depths, full benefits were credited to the proposed improvements. The average annual equivalent benefits in transportation savings that would accrue from the plan of improvement are estimated at \$364,200. These benefits are in addition to those that are being derived by deep-draft commerce using the existing Industrial Canal at its locally constructed depth of 34 feet. Estimated additional benefits of \$15,000 annually would be realized from reduction in navigation hazards on the Industrial Canal through the additional width provided for the channel and through easing of the sharp bend leading from the Texas City turning basin into the Industrial Canal.

62. Annual benefits for enlargement of the Texas City turning basin from greater convenience and safety in turning tankers larger than 38,000 dwt., and from reduction in hazards to navigation, are estimated to be at least equal to the total annual charges of \$37,200. Details of methods and computations used to estimate the benefits are contained in appendix II. A summary of the benefits creditable to the proposed plan of improvement is as follows:

TABLE I
SUMMARY OF BENEFITS
FOR PLAN OF IMPROVEMENT

Item	Average annual equivalent benefits
Enlargement of the Texas City Channel turning basin (Accommodation of larger vessels and reduction in hazards)	\$37,200 ^{1/}
Additional benefits derived by enlarging the Industrial Canal	
a. Savings in transportation costs	364,200 ^{2/}
b. Reduction in navigation hazards	<u>15,000</u>
Total	\$416,400

^{1/} Equated to estimated annual charges

^{2/} Does not include benefits from existing deep-draft facility dredged by local interests. These benefits equated to estimated annual charges are \$114,300 annually, which accrues to existing commerce.

63. Comparison of benefits and costs.- The estimated average annual benefits, the annual charges, and ratio of benefits to charges for the plan of improvement for Texas City Channel (Industrial Canal), based on February 1970 price levels, are given below:

Average annual equivalent benefits	\$416,400
Annual charges	137,600
Ratio of benefits to charges	3.0

APPORTIONMENT OF COSTS

64. Apportionment of costs among interests.- The apportionment of the estimated first costs and annual costs of maintenance of the recommended improvements between the Federal and non-Federal interests is based on present Federal policies for navigation projects. For multi-user channels, construction and maintenance costs for the navigation improvements are apportioned to the United States. The local interests costs for the construction and maintenance of these improvements include the costs for: rights-of-way; spoil disposal areas, including any necessary retaining dikes, bulkheads, and embankments; and the alteration of structures. A summary of estimated first costs and the estimated additional annual maintenance and operation costs, for the plan of improvement is shown in table J.

TABLE J

APPORTIONMENT OF COSTS FOR PLAN OF IMPROVEMENT

Item	Cost
<u>First costs</u>	
<u>Federal</u>	
Corps of Engineers	\$1,626,000 ^{1/}
U. S. Coast Guard	49,000
Total Federal first cost	<u>1,675,000</u>
<u>Non-Federal</u>	
Non-Federal public	76,000
Non-Federal private	2,000
Total non-Federal first cost	<u>78,000</u>
Total first cost	1,753,000
<u>Additional Annual Cost of Maintenance, Operation, and Replacement</u>	
<u>Federal</u>	
Corps of Engineers, dredging	37,300 ^{2/}
U. S. Coast Guard, aids to navigation	4,800
Total additional Federal annual M&O costs	<u>42,100</u>
<u>Non-Federal</u>	
Non-Federal public, spoil areas, levees and spillways	1,300 ^{3/}
Non-Federal, relocations	0
Total additional non-Federal annual M&O costs	<u>1,300</u>
Total additional annual M&O costs	\$43,400

- ^{1/} Includes reimbursement of \$122,000 to Union Carbide Corp. for dredging performed within the project limits of the authorized Federal project for the shallow-draft Industrial Barge Canal and turning basin.
- ^{2/} Includes \$13,000 for Federal assumption of maintenance requirements of the existing deep-draft Industrial Canal and basin dredged by local interests.
- ^{3/} Estimated annual maintenance cost, spoil disposal facilities for existing Industrial Canal and basin. (See table A, appendix III)

LOCAL COOPERATION

65. Proposed local cooperation.- Modification of the existing project for Texas City Channel, Texas, to provide for the improvements proposed in this report would be subject to the requirements of local cooperation generally specified by law for Federal navigation projects. It is proposed that the local interests shall be required to participate in the plan of improvement as follows:

a. Provide without cost to the United States all lands, easements, and rights-of-way required for construction and subsequent maintenance of the improvements and for aids to navigation upon request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of spoil, and also necessary retaining dikes, bulkheads, and embankments therefor or the costs of such retaining works;

b. Hold and save the United States free from damages due to the construction works;

c. Accomplish, without cost to the United States, all alterations of pipelines, powerlines, cables, and other utility facilities, when and as required for construction of the improvements;

d. Accomplish, without cost to the United States, removal of barge mooring anchors from the east side of the Texas City turning basin;

e. Provide and maintain without cost to the United States depths in berthing areas and local access channels serving the terminals commensurate with the depths provided in the related project areas; and

f. In accordance with applicable Federal, State, and local laws and authorities, establish regulations or otherwise promote the adoption of measures to prohibit the discharge of pollutants into the waters of the proposed improvements by users thereof.

COORDINATION WITH OTHER AGENCIES

66. Initiation of studies.- A notice of the public hearing held in Texas City, Texas, on April 14, 1966 was sent to all known Federal, State and local agencies that were believed to have a possible interest in the proposed navigation improvements for Texas City Channel (Industrial Canal). Each fiscal year the Galveston District coordinates its entire General Investigations program with other Federal agencies. By this means the other agencies are advised of the nature and status of all surveys in progress.

67. Prior to completion of this report, the proposed plan of improvement was furnished for field level review and comments to the Division of Planning Coordination, Office of the Governor of Texas, and to all Federal agencies that had indicated interest in the survey. Replies from these agencies are included in appendix IV and summarized in the following paragraphs.

68. U. S. Fish and Wildlife Service.- The Assistant Regional Director, Cooperative Services, U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, advises that "the proposed plan of improvement would neither affect significantly fish and wildlife resources nor offer feasible opportunities for the improvement of those resources."
69. U. S. Coast Guard.- The Commander, 8th Coast Guard District, furnished estimates of costs for relocation, establishment, and maintenance of the navigation aids that would be required for the plan of improvement, but otherwise made no comments.
70. U. S. Public Health Service.- The Senior Water Resources Consultant, Environmental Control Administration, Public Health Service, U. S. Department of Health, Education, and Welfare, advises that it would appear that no effects upon the public health of the area may be anticipated from the proposed improvements.
71. Federal Water Pollution Control Administration.- During the progress of the studies for this report, the Regional Director, Federal Water Pollution Control Administration (now named Federal Water Quality Administration), Department of the Interior, advised that the proposed improvements would not contribute to, or alleviate, water pollution. He recommended that any additional spoil not extend beyond the limits of existing spoil areas. No formal reply was received following distribution of the plan of improvement to the agency for final field level review and comments. Information was furnished informally that, because of previous commitments and a shortage of personnel, the Federal Water Pollution Control Administration would be unable to conduct its final field level review. If further comments were deemed necessary, they would be furnished during review of the project at Inter-Agency level. The materials to be excavated are mostly sands and heavy clays. Such materials deposit rapidly when discharged from hydraulic dredging, and there should be no appreciable flow of materials beyond the limits of previous spoil deposits. No confining levees or structures are proposed for the spoil area on Snake Island. However, this matter will be further considered during preconstruction planning for the improvements. Spoil deposited on land south of the Industrial Canal would be confined by levees to prevent its escape from the spoil disposal areas.
72. U. S. Bureau of Mines.- The Chief, Bartlesville Office of Mineral Resources, Bureau of Mines, Department of the Interior, advises that the plan of improvement apparently would not impair mineral activities or access to mineral resources and is acceptable to his agency.
73. U. S. Bureau of Reclamation.- The Regional Director, Region 5, Bureau of Reclamation, Department of Interior, advises that the proposed plan will have no known effect on any existing or proposed projects of his agency.
74. In addition to their comments furnished below, two agencies of the Department of the Interior suggested further coordination of the report with certain agencies of the State. Copies of the report draft were furnished to the Division of Planning Coordination, Office of the Governor of Texas,

for coordination with all interested State agencies. The views and comments received from the Office of the Governor are summarized in paragraph 75.

a. U. S. Bureau of Outdoor Recreation.-- During the progress of the survey, preliminary plans were furnished to the Regional Director, Mid-Continent Region. The Regional Director advised that he did not believe the project would have a substantial effect on outdoor recreation or natural beauty, and it did not appear that the project would offer opportunity to enhance these functions. Following his receipt of the report draft, the Regional Director furnished an interim reply advising that his agency presently is faced with a backlog of similar reviews on authorized projects, and he was unable to answer at this time.

b. U. S. National Park Service.-- The Acting Regional Director, Southwest Region, National Park Service, advises that the project would not affect the National Park System or sites eligible for the Registry of National Landmarks. However, archeological values exist in the project area and his office should be given advance notice of construction that would allow lead time for their archeological investigations.

75. Division of Planning Coordination, State of Texas.-- The Director, Division of Planning Coordination advises that, although no objections to the proposed development plan are offered by State agencies, the Texas Water Quality Board calls attention to three points which it considers significant regarding construction procedures. The Water Quality Board suggests that determinations be made regarding the characteristics of bottom sediments in the channels and basins to be sure that, during the use of Snake Island as a spoil disposal area, waste water from the dredging operations does not create a water quality problem. Secondly, attention is directed to the planned use of the interior spoil disposal area for the construction of additional waste treatment facilities by Union Carbide Corporation, and to the possible need to control the quality of water drained from the area during disposal operations. The third point by the Water Quality Board is a recommendation that reasonable measures be taken to control turbidity and siltation in the vicinity of all dredging operations. Industrial plant waste effluents are discharged into Galveston Bay at two locations south of the navigation project. The discharge rates and quality standards of waste effluents are prescribed in permits issued by the Water Quality Board. There is no direct flowage route from the two effluent discharge points to the inshore navigation channels and basins. Accordingly, the bottom sediments mentioned by the Water Quality Board should be similar to shoal materials removed from the channels and basins and deposited in the Snake Island spoil area numerous times in the past without apparent adverse effects. The matter, however, will be further investigated during preconstruction planning stages of the project if authorized. If found necessary at that time, levees and spillways could be used along the bayward side of the spoil area to control the quality of dredging waste water entering Galveston Bay. No problems in coordinating use of the interior spoil area with the construction of future waste treatment facilities are anticipated, and local interests have agreed to provide necessary levees and spillways to confine dredged materials within the area. Accordingly, drainage water from the interior spoil area should not create a water quality problem. During construction and maintenance of the navigation improvements, reasonable measures to minimize turbidity and siltation in the vicinity of dredging operations would be required.

DISCUSSION

76. Discussion.- This report comprises the results of investigations to determine whether modifications of the Texas City Channel navigation project are advisable at this time. Local interests requested extensive improvements, all of which were investigated. Preliminary investigations determined that certain improvements either were not feasible, or could not be economically justified, and these improvements were not studied in detail. Proposed improvements investigated in detail included: widening of the Texas City turning basin at its project depth of 40 feet to permit safe and convenient turning and maneuvering of larger tankers and bulk carriers than can be accommodated safely in the existing width of the turning basin; extension of the deep-draft project to incorporate the locally constructed deep-draft Industrial Canal and basin into the Federal project and to enlarge this facility by widening and deepening to accommodate the existing and prospective vessel traffic of tankers up to 38,000 dwt.

77. All investigations of the improvements considered in detail resulted in favorable findings. The most appropriate scale of development for improvement of the Industrial Canal and basin was found by a process of maximizing excess benefits over costs between three alternate plans investigated. In addition to the navigation improvements requested by local interests, the Union Carbide Corp. requested that it be reimbursed in the amount of \$131,000 for dredging performed within the project limits of the authorized but unconstructed Federal project for the shallow-draft Industrial Barge Canal and turning basin. This work was performed when the Union Carbide Corp. constructed the deep-draft Industrial Canal and turning basin along the alignment of the Industrial Barge Canal in 1964. The requested amount of reimbursement represented the estimated Federal cost for performing the work, including \$122,000 for dredging and \$9,000 for navigation aids. If the Industrial Canal and turning basin are authorized as Federal project channels, it is considered reasonable to reimburse the Union Carbide Corp. for the dredging work performed within the limits of the shallow-draft Industrial Barge Canal and turning basin. With the recommended enlargement of the deep-draft Industrial Canal, the aids to navigation will require relocation and rebuilding. The salvage value of the existing structures is uncertain. Accordingly, reimbursement for the navigation aids is not recommended, which leaves the estimated cost for dredging of \$122,000 as the net amount recommended for reimbursement.

78. The recommended widening of the Industrial Canal along its south side will place the top of the channel side slopes close to an industrial waste disposal ditch paralleling the canal along its south side. The Union Carbide Corp. is planning to construct new waste disposal facilities which will involve abandonment of this waste ditch. The new waste disposal facilities are planned for construction in the relatively near future and should be completed well in advance of the probable construction date of improvements recommended herein.

79. The River and Harbor Act of July 15, 1960 authorized the 16 feet to 12 feet deep Industrial Barge Canal and Turning Basin. With construction of the deep-draft Industrial Canal and turning basin by the Union Carbide Corp., there is no further need for the barge canal and its turning basin and the portions of these facilities not incorporated into the recommended deep-draft project are therefore recommended for deauthorization.

80. The requirements of local cooperation described in paragraph 65 and the plan of improvement recommended in this report have been presented to the city of Texas City, which represents the local interests. The city has accepted the plan and indicated willingness to furnish the required items of local cooperation.

81. Additional information called for by Senate Resolution 148, 85th Congress, adopted January 28, 1958, is contained in an attachment to this report.

CONCLUSIONS

82. Conclusions.- Based on the findings of this survey, it is concluded that:

a. The authorized width of the Texas City turning basin is not adequate to accommodate with reasonable safety and convenience the prospective traffic of large tankers and bulk carriers.

b. The authorized deep-draft project should be extended to include the locally dredged deep-draft Industrial Canal and turning basin with enlargement by widening and deepening to accommodate the prospective deep-draft traffic.

c. The total first cost of the proposed improvements is estimated at \$1,753,000 of which \$1,675,000 would be apportioned to the Federal Government (\$1,626,000, Corps of Engineers; \$49,000, U. S. Coast Guard) and \$78,000 would be apportioned to the local interests. Of the \$1,626,000 apportioned to the Federal Government, \$122,000 would be reimbursement to the Union Carbide Corp. for dredging that portion of the deep-draft canal enlargement within the authorized but unconstructed dimensions of the Federal shallow-draft project for the Industrial Barge Canal and turning basin. The improvements would have estimated annual charges of \$137,600, estimated annual benefits of \$416,400, and a benefits to costs ratio of 3.0 based on February 1970 price levels. Additional annual costs of maintenance and operation are estimated at \$43,400, of which \$42,100 would be borne by the Federal Government (\$37,300, Corps of Engineers; \$4,800, U. S. Coast Guard) and \$1,300 would be borne by local interests.

83. It is further concluded that authority for maintenance and enlargement of certain portions of the locally constructed Industrial Barge Canal and turning basin authorized by the River and Harbor Act of July 14, 1960 but not incorporated into the plan of improvement, is no longer needed and should be rescinded.

RECOMMENDATIONS

84. Recommendations.- It is recommended that the existing projects for the Texas City Channel, Texas, be modified to provide for widening of the Texas City turning basin and for enlargement of the existing locally dredged Industrial Canal and turning basin generally as described in the plan of improvement of this report, with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, subject to the condition that the local interests agree to:

a. Provide without cost to the United States all lands, easements, and rights-of-way required for construction and subsequent maintenance of the improvements and for aids to navigation upon request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of spoil, and also necessary retaining dikes, bulkheads, and embankments therefor or the costs of such retaining works;

b. Hold and save the United States free from damages due to the construction works;

c. Accomplish, without cost to the United States all alterations of pipelines, powerlines, cables, and other utility facilities, when and as required for construction of the improvements;

d. Accomplish, without cost to the United States, removal of barge mooring anchors from the east side of the Texas City turning basin;

e. Provide and maintain without cost to the United States depths in berthing areas and local access channels serving the terminals commensurate with the depths provided in the related project areas; and

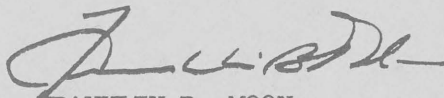
f. In accordance with applicable Federal, State, and local laws and authorities, establish regulations or otherwise promote the adoption of measures to prohibit the discharge of pollutants into the waters of the proposed improvements by users thereof.

85. It is also recommended that the Union Carbide Corp. be reimbursed \$122,000 for dredging that portion of the locally constructed 34-foot

by 200-foot Industrial Canal and turning basin located within the project limits of the authorized but unconstructed Federal project for the shallow-draft Industrial Barge Canal and turning basin.

86. It is further recommended that all portions of the shallow-draft Industrial Barge Canal and turning basin authorized as part of the Federal project for Texas City Channel, Texas, by the River and Harbor Act of July 14, 1960, in accordance with House Document No. 427, 86th Congress, 2d Session, not incorporated into the plan of improvement recommended above, be deauthorized.

87. The net cost to the United States for work in accordance with the above recommendations (exclusive of aids to navigation) is estimated to be \$1,626,000 (\$1,504,000 construction and \$122,000 recommended reimbursement) and an increase of \$37,300 in the cost of annual maintenance.



FRANKLIN B. MOON
Colonel, CE
District Engineer

3 Incls

1. Plates 1, 2 & 3
2. Appendixes I thru IV
3. Senate Resolution 148
attachment

[First endorsement]

SWDPL-F

SUBJECT: Review of Reports on Texas City Channel, Texas
(Industrial Canal)

DA, Southwestern Division, Corps of Engineers, 1114 Commerce Street,
Dallas, Texas 75202 31 Mar 70

TO: Chief of Engineers

I concur in the conclusions and recommendations of the District Engineer.

H. R. Parfitt

H. R. PARFITT
Brigadier General, USA
Division Engineer

REVIEW OF REPORTS ON
TEXAS CITY CHANNEL, TEXAS
(INDUSTRIAL CANAL)

APPENDIX IV

COMMENTS BY OTHER AGENCIES

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REVIEW OF REPORTS ON
TEXAS CITY CHANNEL, TEXAS
(INDUSTRIAL CANAL)

APPENDIX IV

COMMENTS BY OTHER AGENCIES

INTRODUCTION

In accordance with the Interagency Agreement on Coordination of Water and Related Land Resources Activities approved by the President on May 26, 1954, a draft of the report text and a set of pertinent plates and exhibits were sent to all Federal agencies believed to have possible interest in improvements to Texas City Channel for field level review. Letters from the agencies containing their comments or replies are presented in this appendix. Copies of the report text draft and pertinent plates and exhibits also were furnished to the Division of Planning Coordination, Office of the Governor of Texas, for review by concerned departments and commissions of the State government. The views and comments received from the Office of the Governor of Texas also are presented in this appendix.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

June 20, 1969

In reply refer to: RB

District Engineer
Corps of Engineers, U. S. Army
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. D. T. Graham's letter of March 21, 1969, your reference SWGED-P, requested our comments on the proposed navigation improvements to the authorized Texas City Channel Project, Texas.

This letter constitutes the Bureau of Sport Fisheries and Wildlife's report on the effects of the proposed improvements on fish and wildlife resources. It has been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). It has been coordinated with the Bureau of Commercial Fisheries and has received concurrence from the Texas Parks and Wildlife Department as indicated in the enclosed copy of the letter dated May 29, 1969, signed by Mr. J. R. Singleton, Executive Director.

The proposed plan of improvement would provide for widening of the main Texas City Turning Basin from 1,000 feet to 1,200 feet at the authorized 40-foot depth; for enlarging the locally dredged 34-foot by 200-foot Industrial Canal to 40 feet by 250 feet; and for deepening the locally dredged 34-foot by 1,000-foot by 1,150-foot Basin "A" to 40 feet. The plan also would include Federal maintenance of the Industrial Canal and Basin "A".

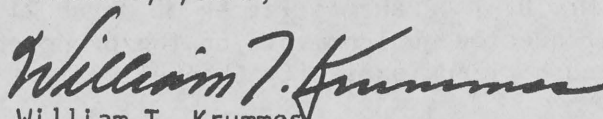
The Bureau of Sport Fisheries and Wildlife has previously commented on the widening of the main Texas City Turning Basin from 1,000 to 1,200 feet in a letter report to your office dated September 2, 1966. The Bureau also reported on enlargements of previously constructed channels and basins for the Texas City Channel Project by letter report to your office dated September 9, 1959.

Our review of the project plan for the Texas City Channel indicates that the proposed work concerns enlargement of previously constructed channels and basins. For this phase of work, spoil would be placed on Snake Island east of the Texas City Turning Basin and on vacant land about 0.3 mile south of Basin "A" and the Industrial Canal. Snake Island has been used for spoil deposition in previous dredging operations. Materials placed on Snake Island would be deposited beyond the crests of existing mounds or levees and the discharge water would flow easterly and southerly into Galveston Bay.

Eventually, plans may be made to place spoil from maintenance dredging on a marsh at the north end of Swan Lake. Spoil placement on this area is not a part of the present project plan. When that area is being considered for spoil placement in the future, coordination with the Texas Parks and Wildlife Department and the Bureau of Sport Fisheries and Wildlife will be required.

The proposed plan of improvement would neither affect significantly fish and wildlife resources nor offer feasible opportunities for the improvement of those resources.

Sincerely yours,


William T. Krummes
Regional Director

Enclosure

Copies 10

Distribution:

- (5) Executive Director, Texas Parks and Wildlife Department, Austin, Texas
- (2) Reg. Dir., Bureau of Commercial Fisheries, Reg. 2, St. Petersburg, Fla.
- (2) Lab. Dir., Biol. Lab., BCF, Galveston, Texas
- (2) Reg. Dir., Federal Water Pollution Control Adm., South Central Region, Dallas, Texas
- (2) Reg. Dir., Bureau of Outdoor Recreation, Mid-Continent Reg., Denver, Colo.
- (1) Reg. Coordinator, USDI, Southwest Region, Muskogee, Oklahoma
- (2) Field Supervisor, BSFW, Div. of River Basin Studies, Fort Worth, Texas

TEXAS
PARKS AND WILDLIFE DEPARTMENT

COMMISSIONERS

L. P. GILVIN
CHAIRMAN, AMARILLO
JAMES M. DELLINGER
MEMBER, CORPUS CHRISTI
HARRY JERSIG
MEMBER, SAN ANTONIO



J. R. SINGLETON
EXECUTIVE DIRECTOR
ROBERT G. MAUERMANN
DEPUTY DIRECTOR

JOHN H. REAGAN BUILDING
AUSTIN, TEXAS 78701

RB

May 29, 1969

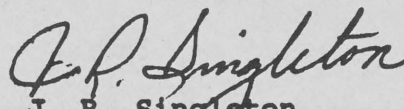
Mr. William T. Krummes
Regional Director
Bureau of Sport Fisheries and Wildlife
Post Office Box 1306
Albuquerque, New Mexico 87103

Dear Mr. Krummes:

This is in response to your letter of May 21, 1969 and the attached review draft of a report concerning the Corps of Engineers plans for the Texas City Channel, Texas.

We have reviewed this draft and concur with the report as presented.

Yours sincerely,


J. R. Singleton
Executive Director

JRS:KCJ:lf

cc: Mr. John Degani, Division of River Basin Studies, Bureau of Sport Fisheries and Wildlife, 402 U. S. Courthouse, Fort Worth, Texas



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDER (oan)
Eighth Coast Guard District
Customhouse
New Orleans, La. 70130

7100/1

5 MAY 1969

Ser 559

From: Commander, Eighth Coast Guard District
To: District Engineer, U. S. Army Corps of Engineers District, Galveston
Subj: Texas City Channel (Industrial Canal); cost for improvements to
Ref: (a) COFE GALV ltr SWGED-P dtd 25 Feb 69

1. The following information is submitted as requested by reference (a).

a. Cost of Improvements

Relocate 6 minor lights @ \$4000	\$24,000
Relocate 1 set of ranges (2 lights)	9,000
Establish 1 range light	6,000
Establish 1 minor light	4,000
Contingencies, administrative costs & price escalation	<u>6,000</u>

Total Funds Required \$49,000

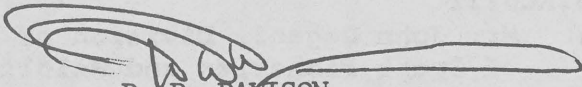
b. The estimated life of these structures is 15 years.

c. Estimated annual maintenance costs

7 minor lights @ \$400	\$ 2,800
2 ranges (3 lights) @ \$500/light	<u>1,500</u>

Total \$ 4,300

2. USC&GS Chart 886 is too small to show the changes we propose. We have, therefore, plotted the new aid locations on a previous edition of your project chart of the area. Even though it does not reflect your latest proposals it does accurately reflect the aid positions we propose.


D. D. DAVISON
By direction

Encl: (1) Project chart



UNITED STATES
DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
SOUTH CENTRAL REGION

1114 Commerce Street
Dallas, Texas 75202

August 11, 1966

Your reference:
SWGED-PP

District Engineer
U.S. Army Engineer District, Galveston
P. O. Box 1229
Galveston, Texas 77550

Dear Sir:

Reference is made to your letter of July 12, 1966 in which you request our views and comments concerning the navigation improvements to the Federally authorized Texas City Channel.

In reviewing the proposed plan of enlarging the Texas City Turning Basin to a width of 1,250 feet and to a length of 4,253 feet with an overall depth of 40 feet, it is our view that this type of project would not contribute to or alleviate water pollution. However, it is felt that due to the already extensive spoil disposal areas now in existence, the added spoil from the enlargement of the channel should not extend beyond the limit of the existing spoil areas.

Sincerely yours,

Jerome H. Svore
Jerome H. Svore
Regional Director



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
MID-CONTINENT REGION
BUILDING 41, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO:

D6427TG

OCT 3 1 1968

Col. Franklin B. Moon, District Engineer
Corps of Engineers, Galveston District
Post Office Box 1229
Galveston, Texas 77550

Dear Colonel Moon:

We appreciate being given an opportunity to review your plans concerning the existing and authorized for construction project specifications of the proposed improvements to the Federal project for the Texas City Channel, Texas.

We have not inspected this project in the field and our comments are based on a cursory review of the project specifications contained in your September 10, 1968 letter and of the print of the project dated August 1968. Based on this cursory office review, we do not believe your project will have a substantial effect, either detrimental or beneficial, on outdoor recreation or natural beauty. In addition, it does not appear that your project will offer an opportunity to enhance these functions.

We would like to point out, however, that outdoor recreation and natural beauty are of tremendous importance in the Galveston Bay area. It is very important, therefore, that you coordinate your planning on this project with the Texas State Liaison Office at the following address:

Mr. Will Odom, Chairman
Department of Parks and Wildlife
Parks and Wildlife Commission
Perry-Brooks Building
Austin, Texas 78701

Thank you for your courtesy in allowing us to review your Texas City Channel Plans.

Sincerely,

John E. Rayburn
for Maurice D. Arnold
Regional Director



UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

REGIONAL OFFICE - REGION 5

P. O. BOX 1609

AMARILLO, TEXAS 79105

IN REPLY
REFER TO: 5-731

JAN 13 1970

Col. Franklin B. Moon
District Engineer
Corps of Engineers
Post Office Box 1229
Galveston, Texas 77550

Your Ref. SWGED-P

Attention: Mr. D. T. Graham, Chief, Engineering Division

Dear Colonel Moon:

Thank you for your letter of January 1 furnishing a draft copy of "Review of Reports on Texas City Channel, Texas" for our review.

The report has been reviewed by this office and our Austin area office. We have no comments to offer as the proposed plan will have no known effect on any existing or proposed Bureau of Reclamation projects.

Sincerely,

Leon W. Hill
Regional Director



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

ROOM 204 FEDERAL BUILDING
BARTLESVILLE, OKLAHOMA 74003

January 15, 1970

D. T. Graham, Chief
Engineering Division
Department of the Army
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Refer to: SWGED-P

Dear Mr. Graham:

We have studied the Review Report on Texas City Channel, Texas (Industrial Canal) as requested by you on January 1, 1970.

Though Galveston County had production of petroleum, natural gas, natural gas liquids, shell, clays, and sand and gravel valued at \$57.4 million in 1968, we have no record of any mineral production or mineral resources in the area of the Industrial Canal. The report states that construction of the plan of improvement would not require alteration of any pipeline or cable crossing, and provides reimbursement to mineral-associated industry for dredging accomplished privately within the limits of an authorized Federal project.

The plan of improvement apparently would not impair mineral activities or access to mineral resources and is acceptable to this office.

Sincerely yours,

Floyd D. Everett, Chief
Bartlesville Office of
Mineral Resources



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

January 19, 1970

In reply refer to: RB

District Engineer
Corps of Engineers, U. S. Army
Post Office Box 1229
Galveston, Texas 77550

Dear Sir:

Mr. D. T. Graham's letter of January 1, 1970, referenced SWGED-P, regarding the authorized project for Texas City Channel, Texas, provided a draft of the Review of Reports on the Industrial Canal portion of the project for our review and comment.

We have reviewed the draft report and note that the draft accurately sets forth our views regarding fish and wildlife resources. We understand that our letter report on the project dated June 20, 1969, will be appended to your review of reports.

Thank you for the opportunity to review the draft.

Sincerely yours,

W. O. Nelson, Jr.
Acting Regional Director

cc:
Executive Director, Texas Parks and Wildlife Department, Austin, Texas
Field Supvr., BSWF, Division of River Basin Studies, Fort Worth, Texas



IN REPLY REFER TO:

D6427TG

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
MID-CONTINENT REGION
BUILDING 41, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

JAN 20 1970

Mr. D. T. Graham, Chief
Engineering Division
Galveston District
Corps of Engineers
Post Office Box 1229
Galveston, Texas 77550

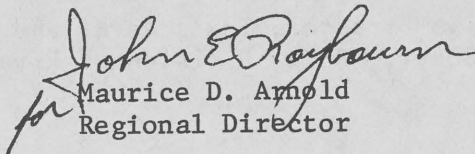
Dear Mr. Graham:

Thank you for a copy of the draft report and your letter dated January 1, 1970 regarding navigation improvements to the authorized Texas City Channel project.

We will certainly make every effort to review and evaluate the recreational potential of the project. However, we are presently faced with a backlog of similar reviews on authorized projects and it may be some time before your project can be reached.

Thank you for the opportunity to comment. We would appreciate receiving a copy of the completed report.

Sincerely yours,


Maurice D. Arnold
Regional Director



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGIONAL OFFICE
1114 COMMERCE STREET
DALLAS, TEXAS 75202

PUBLIC HEALTH SERVICE
CONSUMER PROTECTION AND
ENVIRONMENTAL HEALTH SERVICE

January 23, 1970

Your Reference: SWGED-P

Mr. D. T. Graham
Chief, Engineering Division
Galveston District, Corps of Engineers
Department of the Army
P.O. Box 1229
Galveston, Texas 77550

Dear Mr. Graham:

Thank you for your letter of 1 January 1970 furnishing us with a draft of your report "Review of Report on Texas City Channel, Texas (Industrial Canal)," requesting our review and comments.

We note that the project involves navigation improvements, and "Would have no bearing on water power, flood control, water quality, pollution abatement, irrigation, land reclamation, recreation, aesthetics, or any other purpose involving the control or conservation of water resources except fish and wildlife." Also on page 34, "The proposed soil disposal areas along the Industrial Canal and on Snake Island are not susceptible to either recreational use or beautification for aesthetic considerations. The areas are not readily accessible to visitors or visible to the general public." Since the report goes on to state on page 40, "All work in the plan of improvement concerns the excavation and disposal of materials" and on page 52 "Spoil deposited on land areas south of the Industrial Canal will be suitably confined by levees to prevent its escape from the spoil disposal areas."

It would appear that no effects upon the public health in the area may be anticipated.

The opportunity to review your report draft was appreciated.

Sincerely yours,

William H. Davis, P.E.
Senior Water Resources Consultant
Environmental Control Administration



EXECUTIVE DEPARTMENT
AUSTIN, TEXAS 78711

PRESTON SMITH

GOVERNOR

February 11, 1970

Colonel Franklin B. Moon, CE
District Engineer, Galveston District
Corps of Engineers, U.S. Army
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel Moon:

The various State agencies cooperating with my Division of Planning Coordination have studied your "Review of Reports on Texas City Channel, Texas (Industrial Canal)," forwarded by you on January 6, 1970.

Although no objections have been offered to the proposed plan of development, the Texas Water Quality Board calls attention to three significant points regarding construction procedures:

1. Consideration should be given to defining the characteristics of bottom sludges and sediments in the existing ship channel, turning basin, and industrial canal. This would also require a projection of the probable quality of water which would be discharged from the spoil disposal area east of the turning basin as a result of removing the sludge desposits. If it is determined that a water quality problem would exist, it is recommended that other spoil disposal sites be used where control could be maintained over the quality of water to be discharged from spoil areas.

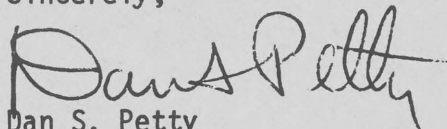
2. The designated spoil areas for initial dredging of Industrial Canal Basin A (200 acres) appears to coincide with the site which Union Carbide Corporation will use for additional waste treatment facilities in the near future. It is suggested that an analysis be made of how these projects will be coordinated so as not to conflict in any way with the implementation of Union Carbide Corporation's program of wastewater treatment. Also, if this spoil disposal area is definitely to be used, the routing of the drainage from the spoil area should be defined. Since this phase of the project will involve dredging or otherwise disturbing existing bottom sludge deposits, control of the quality of the water to be drained from this spoil area may also be necessary.

Colonel Franklin B. Moon
February 11, 1970
Page 2

3. It is recommended that all reasonable measures be taken to control turbidity and siltation in the vicinity of all hydraulic dredging operations.

I am pleased to endorse, as submitted, your plan for improvement of the Texas City Channel and harbor facility. This opportunity to work with you on an important development is appreciated.

Sincerely,



Dan S. Petty
Director
Division of Planning Coordination

DSP/mp

cc: Mr. J. C. Dingwall
Texas Highway Department

Judge Otha Dent
Texas Water Rights Commission

Mr. Harvey Davis
Texas State Soil & Water Conservation Board

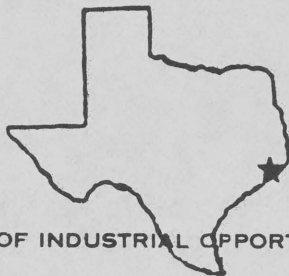
Mr. John R. Singleton, Jr.
Texas Parks & Wildlife Department

Mr. Hugh C. Yantis, Jr.
Texas Water Quality Board

Mr. James H. Harwell
Texas Industrial Commission

Mr. George F. Singletary
Texas Railroad Commission

THE CITY OF



TEXAS CITY

EMMETT F. LOWRY, MAYOR

PORT OF INDUSTRIAL OPPORTUNITY

COMMISSIONERS:

KENNETH T. NUNN
CITY SECRETARY-TREASURER

TEXAS CITY, TEXAS 77590

GAIL G. BRADLEY, MAYOR PROTEM
NOAH J. WELCH
CARL A. RUST
CHAS. T. DOYLE

February 16, 1970

Colonel Franklin B. Moon
Galveston District Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Colonel Moon:

This is to advise that the plan for modifications to the Turning Basin and the Industrial Canal in Texas City are acceptable. The City of Texas City will make every reasonable effort to provide the local cooperation required for the completion of the proposed project.

Yours very truly,

A handwritten signature in dark ink, appearing to read "Emmett F. Lowry". The signature is fluid and cursive, with a long horizontal line extending to the left.

Emmett F. Lowry
Mayor

EFL/sm



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Southwest Region
P. O. Box 728
Santa Fe, New Mexico 87501

L7423-C

March 3, 1970

Mr. D. T. Graham
Chief, Engineering Division
Galveston District, Corps of Engineers
P. O. Box 1229
Galveston, Texas 77550

Dear Mr. Graham:

In accordance with your request of February 6, we are pleased to furnish you with our comments regarding your Survey Report, Texas City Channel, Texas Project.

As presently planned, the project would have no affect on the National Park System or sites presently declared eligible for the Registry of National Landmarks.

Archeological values are known to exist in the project area. We, therefore, request that this office be kept informed regarding construction schedules so that we may have sufficient lead time to carry out any necessary archeological investigations in the project area.

If you have not already done so, we suggest you consult the State Liaison Officer for the National Register of Historic Places as set forth in Section 106, National Historic Preservation Act 1966 (P. L. 89-665) so he will be aware of your proposal. The State Liaison Officer for Texas is Mr. Truett Latimer, Executive Director, Texas State Historical Survey Committee, 108 West 15th Street, Austin, Texas 78701.

We appreciate this opportunity to express our views.

Sincerely yours,

James C. Smith
Acting Regional Director

OFFICE OF
GALVESTON-TEXAS CITY PILOTS

J. S. NATIONAL BANK BUILDING



GALVESTON, TEXAS 77550

May 12, 1970

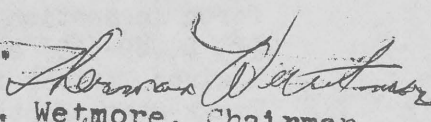
Corps of Engineers
P. O. Box 1229
Galveston, Texas 77551

Gentlemen:

The Galveston-Texas City Pilots concur with the recommendations and conclusions of the Southwestern Division, U. S. Corp of Engineers and the Galveston District Engineers for navigation improvements to the Texas City Turning Basin and the Industrial Canal Channel.

Our views and recommendations for most of these same improvements were submitted in detail to the Corps of Engineers on April 14, 1966 and at subsequent hearings. We are pleased that the Corps of Engineers headquarters at Galveston and Dallas have approved our request.

Sincerely,


Sherman B. Wetmore, Chairman
Galveston-Texas City Pilots

REVIEW OF REPORTS ON
TEXAS CITY CHANNEL, TEXAS
(INDUSTRIAL CANAL)

INFORMATION CALLED FOR BY
SENATE RESOLUTION 148, 85TH CONGRESS
ADOPTED JANUARY 28, 1958

1. Authority.- The following information is furnished in response to Senate Resolution 148, 85th Congress, adopted January 28, 1958.
2. Requests by local interests.- At a public hearing held in Texas City, Texas, on April 14, 1966, navigation interests requested widening of the Texas City Channel and turning basin; construction of a barge mooring area; Federal maintenance and enlargement of the locally dredged, deep-draft Industrial Canal and basin; reimbursement of cost to Union Carbide Corporation for that portion of the locally dredged deep-draft canal and basin located within the limits of the authorized but unconstructed Federal project for the shallow-draft Industrial Barge Canal and turning basin; and that the local cooperation requirements for the project include an item that local interests provide public terminal facilities.
3. Improvements considered.- Based on preliminary investigations it was found that certain of the requested improvements did not warrant detailed investigation. The remaining improvements desired were investigated in detail, and were considered in the formulation of the plan of improvement recommended in the report. The improvements proposed in the recommended plan of improvement include widening of a portion of the Texas City turning basin; Federal assumption and enlargement of the locally dredged, deep-draft Industrial Canal and basin. Reimbursement of \$122,000 to Union Carbide Corporation for construction of that portion of the deep-draft Industrial Canal and turning basin located within the limits of the authorized but unconstructed Federal project for the shallow-draft Industrial Barge Canal and turning basin is also recommended.
4. The recommended plan of improvement has been presented to the local interests that would be responsible for providing the local cooperation required for the improvements if, and when, adopted. They have expressed satisfaction with the plan.
5. A comparison of the costs and benefits for the proposed improvements based on 50-year and 100-year period of analyses is shown in the following table:

ESTIMATED ANNUAL CHARGES AND BENEFITS
FOR RECOMMENDED PLAN OF IMPROVEMENT

Federal investment	\$1,675,000 <u>1/</u>
Non-Federal investment	78,000

	<u>Period of analysis (years)</u>	
	<u>50</u>	<u>: 100</u>
<u>Annual charges</u>		
Federal	\$132,100	\$124,500
Non-Federal	<u>5,500</u>	<u>5,100</u>
Total annual charges	137,600	129,600
<u>Average annual equivalent benefits</u>	416,400	525,700
<u>Benefits to costs ratio</u>	3.0	4.0

1/ Includes recommended reimbursement of \$122,000 to Union Carbide Corp.

○

HOUSTON

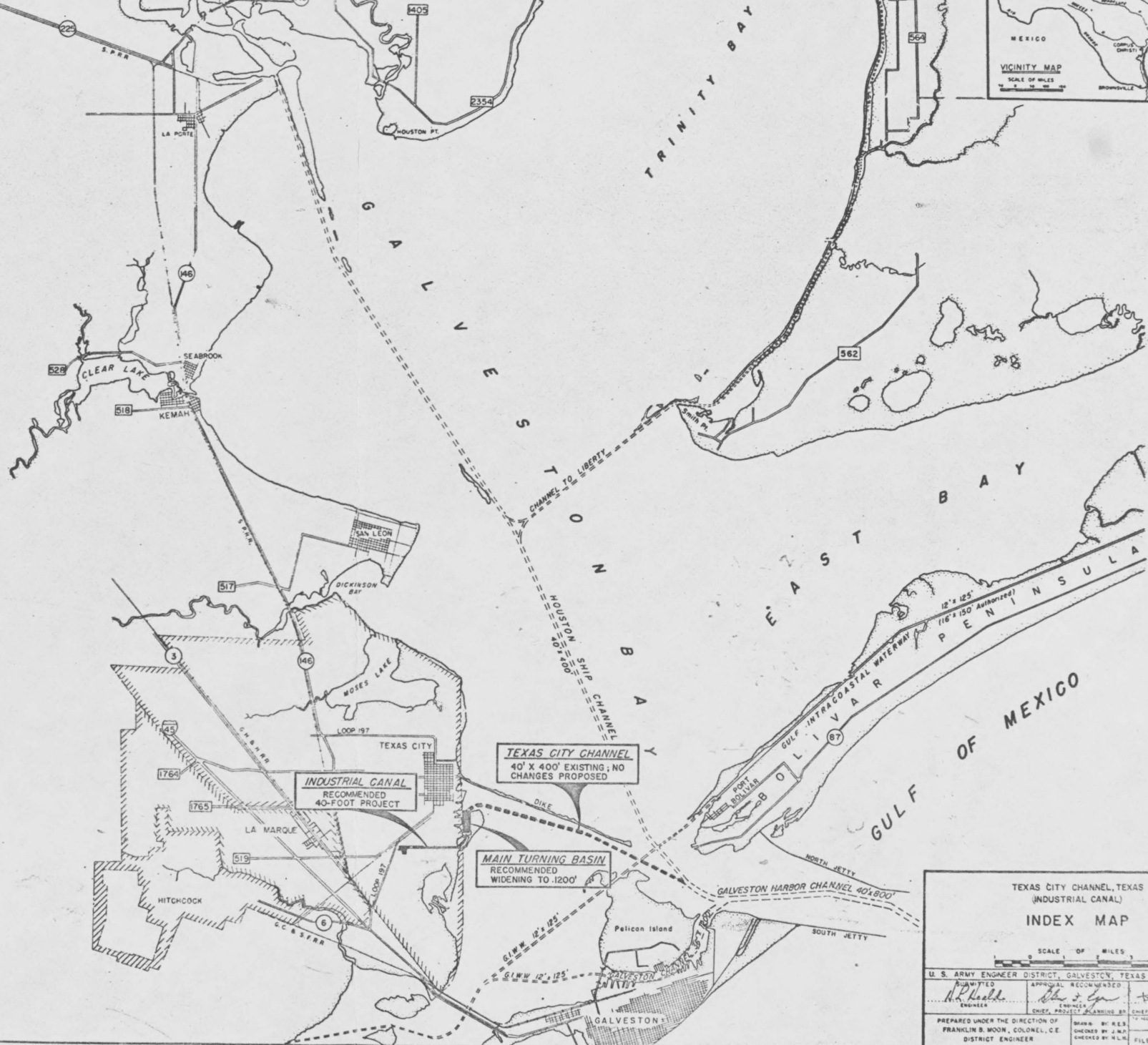
PASADENA

BAYTOWN

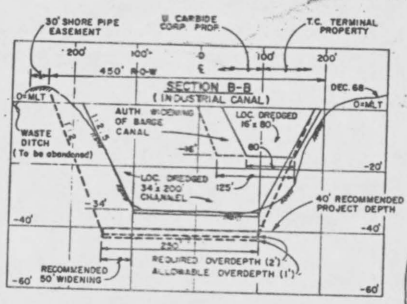
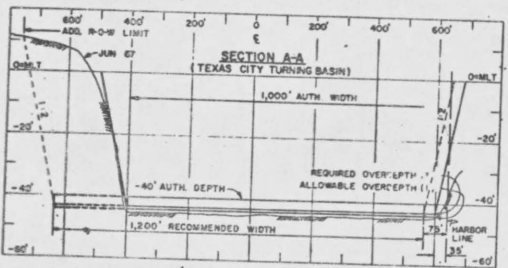
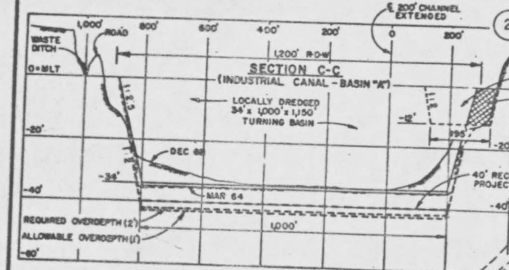
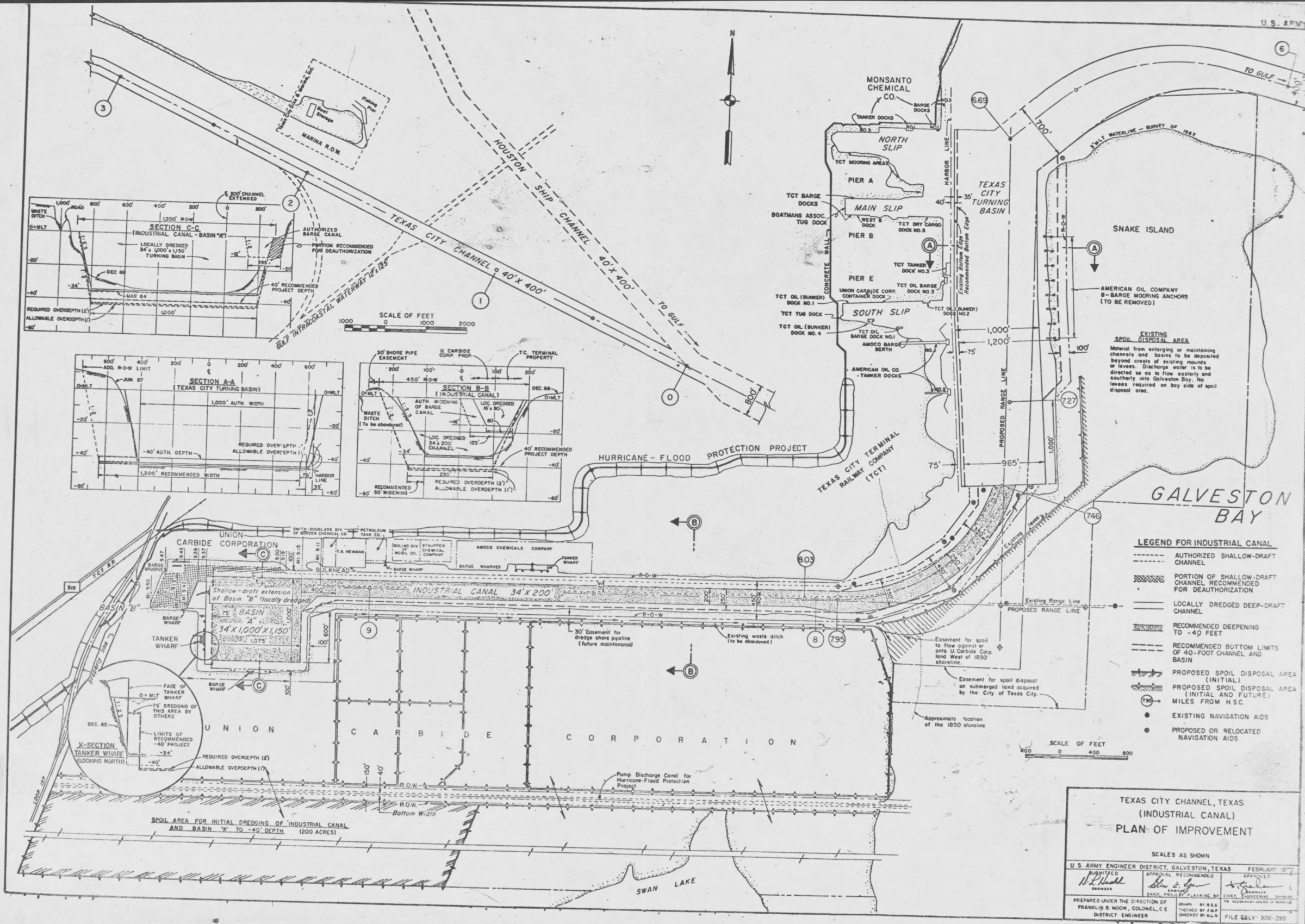
ANAHUAC

VICINITY MAP
SCALE OF MILES
0 10 20 30

N



TEXAS CITY CHANNEL, TEXAS (INDUSTRIAL CANAL)			
INDEX MAP			
SCALE OF MILES 0 10 20 30			
U. S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS			
APPROVED <i>[Signature]</i> ENGINEER	APPROVAL RECOMMENDED <i>[Signature]</i> ENGINEER	APPROVED <i>[Signature]</i> ENGINEER	APPROVED <i>[Signature]</i> ENGINEER
PREPARED UNDER THE DIRECTION OF FRANKLIN B. MOON, COLONEL, C.E. DISTRICT ENGINEER			
DRAWN BY: R.E.S. CHECKED BY: J.M.A. FILE GALV 308-285			



- LEGEND FOR INDUSTRIAL CANAL**
- AUTHORIZED SHALLOW-DRAFT CHANNEL
 - PORTION OF SHALLOW-DRAFT CHANNEL RECOMMENDED FOR DEAUTHORIZATION
 - LOCALLY DREDGED DEEP-DRAFT CHANNEL
 - RECOMMENDED DEEPENING TO -40' FEET
 - RECOMMENDED BOTTOM LIMITS OF 40'-FOOT CHANNEL AND BASIN
 - PROPOSED SPOIL DISPOSAL AREA (INITIAL)
 - PROPOSED SPOIL DISPOSAL AREA (INITIAL AND FUTURE)
 - MILES FROM H.S.C.
 - EXISTING NAVIGATION AIDS
 - PROPOSED OR RELOCATED NAVIGATION AIDS

**TEXAS CITY CHANNEL, TEXAS
(INDUSTRIAL CANAL)
PLAN OF IMPROVEMENT**

SCALES AS SHOWN

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS		FEBRUARY 1972	
APPROVED <i>[Signature]</i> ENGINEER	APPROVAL RECOMMENDED <i>[Signature]</i> CHIEF, PLANNING BR.	APPROVED <i>[Signature]</i> CHIEF, ENGINEERING	APPROVED <i>[Signature]</i> CHIEF, CONSTRUCTION
PREPARED UNDER THE DIRECTION OF FRANKLIN B. MOON, COLONEL, C.E. DISTRICT ENGINEER		CHECKED BY A.E.P. FILE GALV 308-295	

